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Psychological Flexibility and Auditory Hallucinations

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Psychological Flexibility and Auditory Hallucinations

Eric M.J. Morris

Thesis submitted for the degree of Doctor of Philosophy

Institute of Psychiatry, Kings College London

University of London

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Abstract

The Psychological Flexibility Model describes a process-oriented approach to behaviour change that underpins Acceptance and Commitment Therapy (ACT), a contextual cognitive behavioural intervention. ACT promotes psychological flexibility, which refers to a person's ability to connect with the present moment fully as a conscious human being (mindfulness and non-judgemental acceptance), and to change or persist with behaviour that is in line with identified values. For people distressed and/or disabled by auditory hallucinations, it is theorised that this experience is responded to in a psychologically *inflexible* manner: becoming a target for avoidance, control or focus, appraised as more powerful than the person experiencing the voices, and leading to actions that come at the cost of engaging in chosen life directions. Previous research on coping, cognitive models and mindfulness interventions for voice hearing point to the possibility that promoting active acceptance and changing the relationship with voices may be associated with better outcomes. This thesis investigates the role of psychological flexibility with voice hearing using correlational, single-case and experimental research designs.

The first study in this thesis investigated the relationship of psychological flexibility and mindfulness with distress, disability, and behavioural responses to voice hearing, using self-report questionnaires in a sample of 50 distressed voice hearers. The findings suggest that psychological flexibility and non-judgemental acceptance, over and above appraisals of voices and thought control strategies, is related to voice hearers' levels of general depressive and anxiety symptoms, and behavioural resistance to voices, but not to engagement with voices, voice-related distress or life disruption. The second study reports the findings of a 10-session ACT intervention for eight distressed voice hearers using multi-baseline single case design, assessing whether outcome changes following ACT are concomitant with increasing psychological flexibility. Following ACT there were group-level improvements in depressive symptoms, quality of life and social functioning, with changes in psychological flexibility (non-judgemental acceptance, independent action from voices). The third study involved 110 non-clinical participants experiencing simulated auditory hallucinations in an experimental analogue, and investigated differences in response following training in a regulation strategy (acceptance, reappraisal or suppression). This study did not show any significant differences between groups; the potential explanations for this lack of expected difference include the features of simulated voices, sample characteristics, and participants' degree of adherence to the coping strategy. The findings of these studies are considered within the broader context of emotional wellbeing with voice hearing, functional approaches to understanding responding to voices, and potential implications for clinical and research directions.

Acknowledgements

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The participants in my studies, and service user consultants, have taught me much more than the conclusions drawn in this thesis. I continue to remain humbled by the strength that it takes to live with some of the most powerful experiences humans can encounter.

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Overview of the thesis

This thesis investigates the Psychological Flexibility Model and its applicability to understanding and influencing the responses people have to auditory hallucinations.

The thesis is organised into eight chapters: the first four chapters will summarise the literature. The first chapter will review psychological models of hallucinations and coping, set in the broader context of cognitive-behavioural therapies. The second chapter will provide a description and review of contextual behavioural science, the Psychological Flexibility Model, and acceptance and mindfulness processes. In the third chapter interventions based upon the Psychological Flexibility Model will be described, in particular Acceptance and Commitment Therapy (ACT). The empirical evidence for ACT and mindfulness will follow, with specific reference to interventions for people experiencing distressing/disabling auditory hallucinations.The fourth chapter will review the experimental literature on analogues of ACT and cognitive therapy treatment components, and regulation strategies of acceptance, reappraisal and suppression.

Chapters five through to seven describe three studies conducted to investigate the thesis questions. Chapter 5 will report the first study, looking at the relationship of psychological flexibility with voice hearers' wellbeing, beliefs about voices, behavioural responses to voices, and use of thought control using a cross-sectional design; Chapter 6 will describe the second study, a clinical intervention evaluation using a single case design, investigating outcome and process changes during 10 sessions of ACT for people experiencing distressing voices; Chapter 7 will report the third study, an experimental analogue of hearing voices, with non-clinical participants trained in acceptance, reappraisal and suppression as coping methods while completing a challenging task and experiencing simulated hallucinations.

Finally Chapter eight will discuss the results, limitations, implications, and future research directions informed by the findings of the three studies. Appendices of material developed over the course of this period of research follow the chapters, and are indicated in the text.

Chapter 1

Introduction

This chapter will provide a background to a contemporary psychological understanding of auditory hallucinations and how people respond to this experience, which may lead to distress and disability.

This chapter will set the scene by describing the foundational assumptions for this thesis, that are consistent with psychological models of psychosis (the dimensional and single-symptom approaches), and then go on to discuss the phenomena of auditory hallucinations. Cognitive models of auditory hallucination will be outlined, as psychological understandings of hearing voices, emerging from the dimensional approach and what is understood to be the factors associated with disability and need for treatment.

Current understanding of how people respond to the experience of hearing voices will then be reviewed, with a focus on coping and emotion regulation, including the use of suppression and active acceptance. There will be a description of the role of appraisals of hearing voices, and how beliefs influence responses to resist or engage with this experience. Finally there will be a review of the evidence for cognitive-behavioural interventions for auditory hallucinations, in terms of outcomes and processes of change.

1.1 Foundational Assumptions for this Thesis

This section will outline the foundational assumptions that guide the psychological understanding of auditory hallucinations described within this thesis: the dimensional and single-symptom approaches. The advantages of this stance can be described and contrasted with the alternate approach, to consider auditory hallucinations within a categorical (diagnostic) framework.

1.1.1 A Dimensional Approach to Understanding Psychosis

A number of authors have argued that auditory hallucinations lie on a continuum with other experiences (Bentall & Slade, 1985; Johns et al., 2002; van Os et al., 2009). This dimensional model of psychosis makes the assumption that experiencing symptoms such as delusions and hallucinations is not inevitably associated with the presence of a (psychotic) disorder. This is related to a view that psychosis is expressed as a continuous phenotype in the general population, and this phenotype is expressed at levels below what is considered a clinical disorder (van Os, Linscott, Myin-Germeys, Delespaul & Krabbendam, 2009). This low-level psychosis phenotype has been variously called psychosis proneness, psychotic-like experiences (PLEs), or schizotypy (Claridge, 1997; Verdoux et al., 1998; Yung et al., 2003). The factors that increase the risk of a person meeting criteria for a clinical disorder have been hypothesized to be dependent on dimensions of symptoms such as frequency and intrusiveness, and co-morbidities such as mood disorder, in addition to coping, societal tolerance, illness behaviours and associated developmental impairment (Johns & van Os, 2001; van Os et al., 2009).

Esterberg & Compton (2009) present the advantages of both the categorical and dimensional approaches to understanding psychopathology. The categorical approach, using diagnostic criteria, is advantageous in ensuring consistency across researchers and clinicians (by improving reliability), facilitating decision making regarding treatment, and allowing an efficient means of communicating about psychotic syndromes amongst researchers, clinicians and the general public.

In contrast to the categorical perspective, Esterberg & Compon (2009) argue that the dimensional approach is advantageous because it mitigates against the loss of information that occurs when continuous-level data are being categorized; this has been shown to be increasingly advantageous as there is strong evidence for psychotic phenomena being on a continuum in the general population, with more people experiencing anomalous experiences than meet diagnostic criteria for a disorder (van Os, Hanssen, Bijl & Ravelli, 2000; Verdoux, Maurice-Tison, Gay, van Os, Salamon & Bourgeois, 1998). In addition there is a high degree of overlap amongst categorically-defined disorders (e.g., Krueger, Watson, & Barlow, 2005; Taylor & Amir, 1994): this suggests that while reliability is increased using diagnoses, there may be a disadvantage in terms of validity. Finally, the dimensional approach has been found to produce models that allow for greater predictive

power for clinical symptoms, treatment response, and outcomes (Peralta, Cuesta, Giraldo, Cardenas, & Gonzalez, 2002; Rosenman, Korten, Medway, & Evans, 2003).

It is for the advantages described above that this thesis was conducted from a dimensional approach. As the focus of the thesis is understanding, and influencing, peoples' responses to auditory hallucinations, the unit of analysis is this behaviour in context, rather than a diagnostic entity such as schizophrenia. Additionally, from the functional contextual perspective taken within this thesis a categorical approach is antithetical (see Chapter 2 for a detailed discussion of functional contextualism). The advantages of studying phenomena that increases the possibility of informing treatments and understanding outcomes fit with the pragmatic goals of this research.

1.1.2 The Single Symptom Approach

The work in this thesis has also been influenced by the *single-symptom approach* as a research strategy. The argument extends from the dimensional approach described above: it is more pragmatic and empirically progressive to study psychotic symptoms in their own right, as the unit of analysis, rather than through the frame of diagnostic entities, such as schizophrenia (Bentall, Jackson and Pilgrim, 1988). The single-symptom approach has been outlined by several authors (Bannister, 1968; Persons, 1986; Slade & Cooper, 1979). Persons (1986) has argued that the advantages of studying single symptoms are that the focus is on the phenomena, which are usually ignored in models based on diagnosis. By studying single symptoms the problems of diagnosis and classification are avoided, and theoretical development is facilitated; this is particularly relevant with schizophrenia – due to the heterogeneity of symptoms within this category (Bentall, 1990). A substantial number of people diagnosed with schizophrenia do not have auditory hallucinations (Laroi et al., 2012), and to better understand the experience of hearing distressing voices there is greater validity in studying the phenomenon directly, than using the schizophrenia category as the focus . It is also recognised that clinical phenomena are related to normal behavior (the continuum model, as above). A further advantage argued by Persons (1986) is that improvement in classification may follow from a better understanding of individual symptoms.

It has been demonstrated that empirical progression for psychological models of psychosis has been greatly facilitated by the use of the single symptom approach as a research focus (Bentall, Jackson & Pilgrim, 1988; Garety & Hemsley, 1994; Trower & Chadwick, 1995).

Thus, within this thesis, consistent with the single symptom approach, the focus of research has been upon distressing auditory hallucinations as the unit of analysis, and exploring the role of contextual factors such as psychological flexibility on responses to this experience, rather than seeking to investigate these processes within a categorical frame of schizophrenia, or other disorders for which auditory hallucinations are a symptom.

The next section will describe the phenomenon of auditory hallucinations, their prevalence, and relationship to distress and disability.

1.2 Auditory Hallucinations

A hallucination can be defined as an involuntary sensory perception that has the compelling reality of a true perception but occurs in the absence of external stimulation of the related sensory organ (APA, 1994; Slade, 1988). Hallucinations can occur in any sensory modality, and have been found to occur across a range of emotional and organic states, including psychiatric and neurological conditions (Asaad & Shapiro, 1986; Johns, Hemsley & Kuipers, 2002). However, hallucinations are not diagnostically specific, and also occur within the general population without associated disorder (Hanssen, Bak, Bijl, Vollebergh & Van Os, 2005; Ohayan, 2000).

In the case of auditory hallucinations, these experiences tend to have properties of spoken language and are often personified, meaningful and subjective to the person experiencing them (David, 2004). Beavan (2011) describes five essential phenomenological characteristics of auditory hallucinations that have been identified by voice hearers: the content of voices is personally meaningful, the voices have a characterised identity, the person has a relationship with their voices, the experience has a significant impact on their life, and has a compelling sense of reality.

1.2.1 Prevalence & Phenomenology of auditory hallucinations

Estimates of the prevalence of auditory hallucinations in the general population vary across gender, ethnicity and context, as well as being affected by differences in definitions and methodologies used: in a review of the literature Beavan, Read and Cartwright (2011) report that prevalence of hearing voices may range from 3.1% - 19.5% (median 13.2%). In addition, of those people who experience auditory hallucinations it has been found that the proportion of those distressed or disabled by hearing voices (or receiving a mental health diagnosis) is a minority (Bentall & Slade, 1985; Tien, 1991). Thus, although auditory hallucinations have been commonly thought of as symptoms of severe mental illness such as schizophrenia, population prevalence studies suggest an alternate view: that hearing voices may be a variation on normal human experience (Johns & Van Os, 2001).

Laroi et al (2012) provide an overview of the phenomenological features of auditory hallucinations in healthy populations and across a number of clinical disorders. They report that for those who do not seek help, auditory hallucinations may occur only rarely and in specific contexts (during stress, sleep deprivation). In addition studies by Honig et al (1998) and Daalman et al (2011) suggest that, compared to clinical groups, healthy participants who hear voices tend to have fewer negative voices, and are less afraid of them. Their voices are less frequent and shorter in duration, they have more perceived control over their voices, were younger when they first experienced a voice, and experience less distress with less negative voices. Interestingly, they are more likely to report an external explanation for the origin of their voices than the clinical group, suggesting that the difference between the two groups is not merely one of 'insight'. However, they had a greater tendency to attribute the origin of voices to spiritual sources rather than real people (government agents, gang members, neighbours) (Daalman et al., 2011), consistent with other findings that clinical groups are more likely to make specific 'paranoid' appraisals about their psychotic experiences (e.g., Brett et al, 2007). Using the same sample but comparing the healthy voice hearers to matched controls, Sommer et al (2010) report that voice hearing participants, while not having clinically defined delusions, disorganization, or negative symptoms, had a lower global level of functioning than controls, and a significantly greater tendency toward schizotypal and delusional thinking. There was also a greater prevalence of childhood trauma and family history of

mental illness in the hallucinating group. Based on these findings, Sommer et al (2010) and Laroi et al (2012) suggest this group may be considered on the less severe end of the psychosis spectrum.

Laroi et al (2012) report that the phenomenological characteristics of auditory hallucinations in many clinical disorders (substance abuse, dissociate disorders, borderline personality disorder, bipolar disorder) appear to be similar to those of schizophrenia: such patients may experience unpleasant, third person voices that are frequent and uncontrollable, associated with delusional beliefs, elicit anxiety and distressing emotions, and may disrupt functioning.

For those diagnosed with clinical disorders auditory hallucinations are typically experienced as voices, but can also take the form of other sounds (e.g., ringing, animal noises) (Laroi, et al., 2012). Voices are commonly experienced as second or third person speech, and non-personal sentences may also be present. Voices can vary in loudness, with negative derogatory voices being louder than positive voices; there can also be variance in the degree of clarity of voices. Similarly there is variability in the frequency of auditory hallucinations, ranging from once or twice weekly through to a continuous experience of hearing voices. On average, voice hearers report hearing three different voices; voices are more commonly male, and personified by the individual (Nayani & David, 1996). The content of voices are frequently in the form of commands, comments about the voice hearer and others, and descriptions; frequently voices are negative in content, although positive or neutral voices may also be present. Shawyer, MacKinnon, Farhall, Trauer & Copolov (2003) report that nearly half of command hallucinations can stipulate harmful or dangerous actions, although patients report being more likely to comply with trivial rather than harmful command hallucinations (Chadwick & Birchwood, 1994). Amongst other factors, it has been found that those more likely to comply with command hallucinations appraise their voices as omnipotent and benevolent (Beck-Sander et al., 1997) or malevolent (Barrowcliff & Haddock, 2010), and believe that the voice has a known identity (Beck-Sander at al., 1997; Erkwoh, Willmes, Eming-Erdmann & Kunert, 2002).

Auditory hallucinations are a common experience for people who have been diagnosed with schizophrenia, with prevalence estimated between 40-80% (Aleman & Laroi, 2008). For 25-30% of people with schizophrenia auditory hallucinations can be a persisting symptom, despite adherence to antipsychotic medication (Shergill, Murray & McGuire., 1998). An important feature of hearing

voices in schizophrenia is that the person perceives having little control over the experience (Lowe, 1973; Honig et al., 1998). People with schizophrenia vary in their attributions for auditory hallucinations: from considering this experience as being self-generated, through to (more commonly) being caused by an external agent (Stephane, Thuras, Nasrallah & Georgopoulos, 2003).

1.2.2 Summary

Auditory hallucinations are not necessarily a distinguishable symptom of psychotic disorders, occurring in a number of other psychiatric disorders, as well as across a range of neurological and emotional states, and within the healthy population.

It appears that the *presence* of auditory hallucinations does not necessarily predicate specifically poor functioning or disorder, although those who hear voices may show comparatively poorer functioning compared to the general population who do not have this experience. Differences between those distressed and/or disabled to a clinical degree and those who are not, seem to be associated with factors related to the direct experience of hearing voices (greater frequency and duration of voices, presence of more negative voices), as well as factors theoretically amenable to psychological intervention (personal sense of control, appraisals, coping responses).

Cognitive models of auditory hallucinations, which account for these individual differences, are described in the next section.

1.3 Cognitive Models of Auditory Hallucinations

Cognitive theories of psychotic symptoms have emphasised cognitive processes that are hypothesised to be involved in the formation and maintenance of psychotic symptoms. Models of auditory hallucinations are based upon the conceptualisation that they are internal cognitive events misattributed to an external source (Bentall, 1990; Frith, 1992; Morrison, Haddock & Tarrier, 1995). Various theories have speculated that the source of this misattribution is some aspect of cognitive functioning, such as difficulty in the integration of stored material with current

sensory input (Hemsley, 1993), a disruption on language production processes (David, 1994; Hoffman, 1986), or a deficit in internal monitoring (Frith, 1992). The studies by Baker and Morrison (1998) and Morrison & Haddock (1997) suggest that voice hearers may have generalised problems with correctly identifying and attributing the source of internally generated signals (see Waters et al, 2012, for a review).

Other theories have suggested that auditory hallucinations are due to biases in normal cognitive functioning, rather than a cognitive deficit. It has been proposed by Morrison (2001) amongst others that metacognitive processes (such as beliefs and expectations) can influence this bias, and reinforcement processes (in particular anxiety reduction) may facilitate the misclassification of particular types of internally-generated events as externally-generated (see below for further description).

1.3.1 Appraisal-based models

Chadwick, Birchwood and Trower (1996) describe a cognitive model that conceptualizes experiencing an auditory hallucination as an event that results in affective and behavioural consequences through the mediating beliefs about the voices. This model does not speculate on the process that generates auditory hallucinations. The beliefs that Chadwick and colleagues describe are appraisals of the power (omnipotence) and intentionality of the voice(s) (whether they are seen as malevolent or benevolent toward the voice hearer), while the responses toward voices are described as engagement and resistance (described in further detail later in this chapter). This model suggests that psychological intervention should focus on weakening the beliefs about voices' omnipotence and intentions through cognitive restructuring (Chadwick & Birchwood, 1994; Chadwick, Sambrooke, Rasch, & Davies, 2000) , to reduce distress and promote functioning.

Garety, Kuipers, Fowler, Freeman & Bebbington (2001) present a cognitive model of the positive symptoms of psychosis, hypothesising a central role for emotional processes, and accounting for disruptions in automatic cognitive processes, maladaptive appraisals, and social factors in symptom formation and maintenance. Garety et al (2001) put forward that there may be two proximal routes to the development of positive symptoms, the first through a combination of

cognitive and affective changes (most common pathway: a triggering event evokes disruption to cognitive processes in a predisposed person), and the second pathway through affective changes alone. In the first pathway anomalous experiences (due to psychosis proneness) trigger a search for explanation (Maher, 1988), that is influenced by biased conscious appraisal processes, such as a "jumping to conclusions" information gathering style, externalising attributional biases, and deficits in understanding the intentions of others (theory of mind: Premack & Woodruff, 1978; Frith, 2004), which are also susceptible to being worsened by negative emotional states. These changes may occur within a social-cognitive context (adverse social environments, traumatic experiences, isolation) that limits alternative data gathering, heightens negative emotions, reinforces negative schematic models about the self and the world fostering external attributions and low self-esteem (possibly due to an enduring cognitive vulnerability due to early adverse experiences). For a smaller proportion of people, the second pathway is hypothesised to account for developing positive symptoms: triggering events lead to disturbed affect, which activates biased appraisal processes and maladaptive self/other schemas, leading to an externalised appraisal (a delusional belief) for the life event or disturbed affect (Garety et al., 2001).

The Garety et al. (2001) model suggests a number of targets for psychological intervention: 1) altering the key external appraisal so that disturbing hallucinations are appraised as internally-generated, through changing appraisals and negative self-schemata, and compensating for biased reasoning processes, 2) addressing safety behaviours, ineffective coping and problem-solving to disrupt the maintenance cycle, 3) changing social environments by reducing expressed emotion and improving affect from family and care-givers, 4) improving communication with family members so that alternative explanations for psychotic experiences are discussed in manner that changes the externalising appraisal (another means of achieving first target).

Morrison, Haddock and Tarrier (1995) presented a model that proposed that metacognitive beliefs inconsistent with intrusive thoughts lead to the external attribution of these thoughts as auditory hallucinations. This misattribution is maintained by the anxiety-reduction function of reducing cognitive dissonance between the intrusive thoughts and beliefs. The role that metacognitive beliefs and processes play in the maintenance of psychotic symptoms was further developed by Morrison (1998, 2001). These beliefs about cognition may make people vulnerable to emotional

dysfunction (Wells & Mathews, 1994), and hallucinations may be low-level thought intrusions that are mediated by self-beliefs (Baker & Morrison, 1998). Morrison (1998), relating auditory hallucinations to the model of anxiety devised by Clark (1986), suggested that the maintenance of distressing auditory hallucinations may occur where an internal or external trigger results in a normal auditory hallucination that is misinterpreted as threatening to the physical or psychological integrity of the individual (i.e., "I must be mad", "The voices will hurt me unless I obey their commands"). As a result of these misinterpretations there is an increase in physiological arousal and negative mood, which produces more hallucinations, resulting in a vicious circle (Morrison, 1998). In addition, such misinterpretations elicit safety seeking behaviours (such as hypervigilance), which increases the occurrence of auditory hallucinations and prevent the disconfirmation of the misinterpretations, resulting in the maintenance of the belief. Morrison (2001) has also speculated that it may be the way intrusions into awareness are misinterpreted that will lead them to be viewed as psychotic phenomena. It is suggested that it is the cultural unacceptability of the misinterpretation that results in the classification of these phenomena as psychotic.

Some doubts have emerged recently about the putative causal role of metacognitive processes in generating hallucinations, suggesting that they are implicated in the accompanying distress and emotional disorders instead (Varese & Bentall, 2011). Nevertheless, some helpful treatment strategies targeting attentional processes and metacognitive beliefs are suggested by Morrison's model, such as attention retraining, increasing the person's awareness of their metacognitive beliefs, and the teaching of detached mindfulness.

In summary, cognitive models of auditory hallucinations suggest that the components of effective psychological interventions with voice hearers involve: influencing the appraisals of power and intentionality of voices, altering unhelpful metacognitive beliefs, and reducing the use of safety behaviours and avoidance, while strengthening problem-solving and direct attempts to improve the social environment. The models also suggest that treatments target how the person responds to their voices, which possibly maintain distress and disability (discussed in the next section).

1.4 Coping and emotion regulation strategies with auditory hallucinations

The next section will review the literature on how people with psychosis respond to persisting auditory hallucinations. Included in this review is the literature on coping with auditory hallucinations, as well as how people relate to auditory hallucinations. Finally the literature on emotional regulation strategies used by distressed voice hearers will be reviewed, with a particular focus upon the role of suppression, before a summary and implications for research questions are outlined.

1.4.1 Coping with auditory hallucinations

One consideration in the differences in outcome and functioning between people who have auditory hallucinations, has been whether there are ways of coping and responding to this experience that are more effective than others. Natural coping methods (those developed by voice hearers without advice from mental health professionals), as well as the potential of enhancing coping to improve functioning (e.g., Tarrier, Harwood, Yusopoff, Beckett & Baker, 1990) have been the focus of study. Finally, coping has been researched within theoretical frameworks, typically within a stress and coping paradigm (Lazarus & Folkman, 1984).

Most studies of coping with auditory hallucinations have been with samples of people diagnosed with schizophrenia, due to this being a common persisting symptom (as described above). Study samples have varied in terms of whether people have been recruited from community or inpatient settings, have a primary psychotic disorder diagnosis, and how long they have heard voices for, which makes it more difficult to establish reliable findings (e.g., Carter, MacKinnon & Copolov, 1996; Farhall & Gehrke, 1997; Falloon & Talbot, 1981; Romme & Escher, 1993). It is also possible that these samples skew the understanding of coping with voices, as clinical groups may constitute those who have not managed this experience effectively. In a review of this literature, Farhall, Greenwood and Jackson (2007) argue that most coping methods are not specific to hallucinations in schizophrenia: similar methods are reported as ways of coping with psychotic symptoms in general, or by voice hearers diagnosed with other disorders (Breier & Strauss, 1983), as well as by those who have not been in contact with mental health services (Romme & Escher, 1989).

Research in the area of coping with auditory hallucinations has mostly been descriptive, with a smaller set of studies using theoretical frameworks to investigate the functions and effectiveness of coping methods (Farhall, Greenwood and Jackson, 2007). A range of methods have been used to elicit voice hearers' coping methods, with open-ended interviews, semi-structured schedules, and pre-generated lists of coping strategies reported, which may account for differences between studies (see Farhall, Greenwood & Jackson for a review of methods). Descriptive investigations have classified coping methods by topography (e.g., Falloon and Talbot, 1981; Shergill, Murray & McGuire, 1998) or by putative mechanism (e.g., Carter, MacKinnon & Copolov, 1996; Romme & Escher, 1993; Tarrier, 1987).

Voice hearers report a range of strategies to cope with voices (e.g., Falloon & Talbot, 1981; Carter, MacKinnon & Copolov, 1996; Farhall & Gehrke, 1997), although typically people may use a small number of strategies regularly (Frederick and Cotanch, 1995; O'Sullivan, 1994; Singh et al., 2003). Most of the coping strategies that voice hearers report are self-generated (Farhall & Gehrke, 1997; O'Sullivan, 1994; Tsai & Ku, 2005), rather than developed through contact with mental health professionals (although this could be a function of less availability of psychosocial approaches in the settings that these studies were conducted in). Studies have reported a diversity of coping strategies, describing methods that involve behavioural, cognitive and physiological components (Farhall, Greenwood and Jackson, 2007; Frederick & Contach, 1995; Knudson & Coyle, 1999; Nayani & David, 1996). There are some indications that having a limited, inflexible repertoire of coping strategies is associated with greater distress and poorer functioning (Carter et al., 1996; Falloon & Talbot, 1981); in addition, MacKinnon, Copolov & Trauer (2004) report that people who comply with command hallucinations tend to have fewer coping strategies to manage voices compared to those who resist commands.

Several studies suggest that active acceptance of voices (an openness toward the voices being part of the self; not resisting nor engaging with voices to the detriment of personal goals; see discussion further in this chapter), may be associated with better functioning and less distress (e.g., Falloon & Talbot, 1981; Farhall & Gehrke, 1997; Romme & Escher, 1993); in contrast, there are inconsistencies between studies regarding which strategies are regarded as ineffective or associated with poorer functioning. An example is "yelling back at voices", which was reported by

participants to be effective in the Nayani & David (1996) study, but ineffective by Carter, MacKinnon & Copolov (1996) and Tsai & Ku (2005). These inconsistencies may possibly be due to differences in the metrics of what may be regarded as effective (e.g. controlling or stopping voices, reducing distress, or achieving personal goals), as well as variability with the samples recruited.

Descriptive approaches, however, may have limited applicability for developing improved interventions; it may be more pragmatic empirically to adopt an underlying theoretical approach to refine the similarities and distinctions between coping methods in function or effectiveness (Farhall, Greenwood and Jackson, 2007). From this perspective, studies have explored coping methods from a coping and stress framework, conducting factor analyses to group coping methods and investigate links with outcomes (Farhall & Gehrke, 1997; ; Hayashi, Iagarashi, Suda and Nakagawa, 2007; Mann & Packenham, 2006; Singh, Sharan & Kulhara, 2003).

Farhall and Gehrke (1997) investigated coping responses to voices, and ratings of sense of control, distress and overall coping. Participants described using multiple coping strategies including problem-solving, mental disengagement, behavioural disengagement, and decreasing physiological arousal. Farhall and Gehrke (1997) found three factors through principal components analysis: active acceptance, passive coping, and resistance coping. It was found that active acceptance was associated with perceived control over hallucinations, while passive coping predicted reduced distress, and resistance coping predicted greater distress. Singh, Sharan and Kulhara (2003) found a four factor solution (problem-solving, diversion, avoidance and help-seeking), with symptom severity and distress associated with greater use of a problem-solving strategies. Mann & Packenham (2006) found three factors: active coping (distraction), withdrawal (emotion-focused/ arousal reduction strategies), and suppression coping. Mann & Packenham (2006) report that active coping was inversely associated with negative voice appraisals; withdrawal was strongly associated with negative appraisals, voice severity, anxiety and depression; while suppression coping had no significant associations. Finally, Hayashi, Iagarashi, Suda and Nakagawa (2007) found two factors similar to Farhall and Gehrke's (1997) passive coping and resistance coping factors, described as distraction and counteraction (e.g, echoing voices, making noises, retorting to voices). It was found that counteraction coping methods were more likely to be utilized when the auditory hallucinations were experienced as external and powerful

phenomena. These findings may suggest strategies such as active acceptance, distraction or passive coping are more effective than resistance or suppression for voice hearers. However it should be noted that these studies used cross-sectional designs, and causality cannot be determined: it may that those who find their voices are more controllable tend to use active acceptance; in a similar vein, problem solving and efforts to resist may be required when voices are more severe and distressing.

In their review Farhall, Greenwood and Jackson (2007) argue that cross-sectional studies do not show a clear benefit for particular coping strategies; however there does appear to be an association between poor outcome and a smaller natural coping repertoire, and a failure to switch to effective strategies at the expense of less-effective ones. A challenge in assessing the effectiveness of different types of coping with auditory hallucinations is that many studies have considered effectiveness to be measured solely by the outcome of a reduction in the frequency of auditory hallucinations (hallucination control). Farhall, Greenwood and Jackson (2007) suggest that future studies exploring coping with voices and outcome utilise multiple outcomes, such as hallucination control and distress reduction, as it appears that while there may be limited effects for coping strategies reducing the frequency/ intensity of voices, many participants describe reductions in their level of distress when using certain strategies.

There do not appear to be any longitudinal studies investigating the role of coping strategies with auditory hallucinations, relating these with longer-term well-being/ functioning. A study by Delespaul, Vries and van Os (2002) offers an example of how these relationships could be investigated: the authors describe using the Experience Sampling Method over a 1 week period with voice hearers with schizophrenia and depressive disorders, and exploring the links of hallucination intensity, mood, current activity and social contact. Delespaul et al. (2002) report that hallucination intensity was shown to be influenced by context: social withdrawal, work activity and doing nothing producing decreases, while passive leisure activities such as watching TV resulted in increases in hallucination intensity over time. Similar methodologies are required to investigate the effectiveness of coping strategies with auditory hallucinations.

1.4.2 The relationships between broader coping and functioning for people with psychosis

A related literature, concerning the coping strategies of people with psychosis, may be useful in understanding broader relationships of coping styles, wellbeing and functioning. There have been several studies where the focus of coping is undifferentiated with regard to a particular symptom, emotion or challenge (Bak et al., 2003; Boschi et al., 2000).

Bak et al (2003) found that need for care was associated with the severity of psychotic symptoms rather than distress, level of control, or the number of coping strategies. The results suggested that engaging with symptoms may be unsuccessful: coping methods involving symptomatic coping (spending time focused on symptoms; having important actions guided by the content of symptoms) were associated with less perceived control over these symptoms and a higher probability for the need for mental health treatment (Bak et al, 2003).

A longitudinal study by Boschi et al. (2000) investigated the prospective role of coping methods and subsequent psychosocial functioning two years following a first hospitalisation (with an early psychosis sample). The classification of coping methods was consistent with Hollahan and Moos (1987), with strategies categorized as active-behavioural, active-cognitive, and avoidant. Boschi et al (2000) found that active coping (when compared to avoidant strategies) toward positive symptoms predicted improved psychosocial functioning 2 years later. In addition the most frequently used coping strategies were cognitive, while the most effective were behavioural. There was no relationship between number of strategies used, reduction in distress or psychosocial outcome; similarly there was no association found between the use of coping strategies and sense of control over symptoms.

These studies suggest that, for the outcomes of greater functioning and reduced need for mental health care, active coping strategies, and a style of relating to symptoms where actions are chosen independently of symptoms, may be more effective than coping through using avoidance or engaging in efforts to focus on psychotic symptoms.

1.4.3 Emotional regulation strategies and auditory hallucinations

As reviewed earlier in this chapter, suppression and deliberate ignoring are commonly-reported coping methods used to control auditory hallucinations (e.g., Shergill, Murray & McGuire, 1998). The review by Farhall, Greenwood & Jackson (2007) summarised that the coping strategies described by voice hearers are, for the most part, non-specific to managing the stressor of hearing voices or with psychosis, but may reflect broader styles of coping for evocative emotional experiences.

It may be that voice-related disability results from efforts to cope with the emotions evoked by this experience, which may be sustained (and potentially amplified) by difficulties in regulating negative emotions. Therefore there may be value in considering the relationship of emotion regulation strategies, auditory hallucinations, well-being and functioning.

This section will comprise a brief description of how emotion regulation is understood in the general population, with a focus on the use of suppression as a strategy. Following this, the theoretical perspectives that have implicated a role for suppression in the formation and maintenance of auditory hallucinations will be briefly described. Finally, the modest literature for the emotional regulation strategies reported by people with psychosis will be described, specifically for those who hear voices.

1.4.4 Emotion Regulation

Emotion regulation refers to a diverse set of processes in how "individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1999, p. 557). In the emotional regulation literature two strategies have been extensively studied (although not necessarily with psychosis): suppression (reducing emotion-expressive behaviour by inhibition during a state of emotional arousal: Gross & Levenson, 1993) and reappraisal (the reinterpretation of emotionally-valenced stimuli in unemotional terms: Speisman, Lazarus, Mordkoff & Davison, 1964). A more detailed discussion of emotion regulation is in Chapter 4 of this thesis, as part of a review of experimental studies of regulation strategies.

1.4.4.1 Suppression: the effects of inhibiting emotional expression and private experiences

Within the general population, coping by engaging in suppression to inhibit public displays of emotion, as well as toward experiencing private experiences (thoughts, sensations and emotions), is normative (Gross, 1998); the use of suppression is established in childhood but over the course of development to adulthood tends to be relied on less frequently as other coping strategies are acquired (Gullone, Hughes, King & Tonge, 2009; John & Gross, 2004). It appears that the habitual use of suppression in adulthood is associated with a variety of negative outcomes. Thought suppression and emotional avoidance are have been found to increase arousal (Cioffi & Holloway, 1993; Gross & Levenson, 1997; Wegner & Gold, 1995); chronic attempts to suppress or avoid emotional experiences have been shown to increase negative emotions and thoughts, leading to psychological distress (e.g., Roemer & Borkovec, 1994), poor memory and social interactions (Gross & John, 2003), and reduced opportunities to habituate to emotional stimuli (Foa & Kozak, 1986). Hayes and Gifford (1997) have reviewed evidence that suggests that poorer clinical outcomes across a number of disorders are seen in people who frequently use coping strategies aimed at suppressing or avoiding negative emotions and thoughts (described as *experiential avoidance*, and reviewed in Chapter 2), rather than solving problems by overt behaviour change.

The use of suppression as a coping strategy tends to be applied to private experiences that have high social disapproval, or to content that relates to harming self or others (Freeston & Ladouceur, 1993; Purdon & Clark, 1994). The suppression of unwanted thoughts can additionally be conceived as a means of coping with emotional experiences (Lynch, Robins, Morse & Krause, 2001). The literature on the effects of thought suppression suggests that this may result in the paradoxical increased frequency of the experiences targeted for suppression (Wegner, Schneider, Carter and White, 1987; Wenzlaff & Wegner, 2000). Attempted suppression of a thought may lead to a continuation of the unwanted thought because an attempt to “not think of X” requires thinking the very target thought to be avoided (Hayes, 1987). Wegner and Zanakos (1994) found that people who both avoid emotions and use thought suppression experience greater depressive symptoms, than those who only avoided emotions. Finally, it has been found that thought suppression may reduce the conscious control over simultaneously occurring overt behaviours (Bargh & Chartrand, 1999).

1.4.4.2 The role of suppression in psychosis: a formation and maintenance factor?

Cognitive models suggest that suppression and other control-based strategies may play a role in exacerbating and maintaining positive psychotic symptoms (e.g., Morrison, 2001). Morrison, Haddock and Tarrier (1995) proposed that active suppression-based coping strategies may exacerbate intrusive thoughts, psychological distress, autonomic arousal, and auditory hallucinations. As the content of most psychotic symptoms is usually personally salient (Haddock, Bentall & Slade, 1993), it may be that they become prime targets for suppression, especially if the content is considered harmful or socially inappropriate. Morrison (2001) has suggested that selective attention and heightened self-focus in psychosis may increase the actual frequency or perceived frequency of intrusions into awareness, so that safety behaviours and attempts at control are implicated in the maintenance of distress.

Badcock, Paulik and Maybery (2011) hypothesised that over-use of suppression in schizophrenia may contribute to the maintenance of auditory hallucinations by depleting already-limited executive abilities such as inhibitory control, with less successful/ frequent inhibition being associated with increases in the frequency or duration of hallucinations (Waters et al., 2003).

There is some indication that the use of suppression may increase proneness to experiencing auditory hallucinations in healthy samples: Garcia-Montes, Alvarez & Fidalgo (2003) found that instructed suppression of self-discrepant thoughts over a 48 hour period greatly increased vividness of auditory illusions, compared to a focalization instruction (to simply note thoughts and continue with activities).

Psychological models have also considered the influence of metacognitive beliefs (beliefs about thinking and the content of thoughts: Wells, 1995) in reinforcing efforts to control and suppress voices and other unwanted experiences. It may be that people with psychosis are more prone to engaging in unhelpful efforts to control thinking, due to a greater focus on thinking itself: Rosenburg & Tucker (1979) found that people with schizophrenia tend to talk more about issues related to disordered thinking, and make more frequent references to their own cognition, as compared to healthy controls. In investigating the use of thought control strategies in clinical samples, Morrison and Wells (2000) found that people with schizophrenia used significantly more

punishment and worry-based strategies, but in contrast with previous studies, significantly less distraction-based control strategies, than healthy controls. Jones and Fernyhough (2006) found that for non-clinical participants prone to auditory hallucinations, metacognitive beliefs that worrying thoughts are uncontrollable and dangerous positively influenced the use of suppression, and increased intrusive thoughts. Proneness to auditory hallucinations was predicted by this process, in combination with high awareness of thoughts and low memory confidence. However a review and meta-analysis by Varese and Bentall (2011) demonstrated that while metacognitive beliefs are strongly associated with hallucination proneness in non-clinical samples, when co-morbid symptoms are controlled for in clinical samples, there is a weak relationship, suggesting a non-causal role for these beliefs in the development of hallucinations. Varese and Bentall (2011) suggest, however, that metacognitive beliefs may be influential in the distress associated with psychotic experiences.

1.4.4.3 Empirical studies: Emotion regulation for people with psychosis

People with schizophrenia have been found to have comparative deficits in emotional processing (Aleman & Kahn, 2005), and may have greater emotional reactivity than healthy controls (Myin-Germeys et al., 2000). There are indications, however, that the subjective experience of emotion in schizophrenia is not markedly different (Kring & Neale, 1996).

Comparisons of whether people with schizophrenia differ from healthy controls in the use of reappraisal or suppression regulation strategies, have largely found that there are no differences in the self-reported habitual use of strategies (Henry, Rendell, Green, McDonald & O'Donnell, 2008; Perry, Henry & Grisham, 2011). Van der Meer, Wout & Aleman (2009) did find in their study that people with schizophrenia used significantly more suppression and less reappraisal than healthy controls; however the magnitude of differences between groups was small.

Further, Perry, Henry and Grisham (2011) found that people diagnosed with schizophrenia, while using similar levels of reappraisal and suppression coping as healthy controls, did engage in less active acceptance (a response-focused strategy that encourages the experience of emotion and eschews maladaptive avoidance: Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hoffman &

Asmundson, 2008). Perry, Henry and Grisham (2011) report that the use of acceptance was associated with less anxiety, depression and stress in both samples, as well as being associated with better psychosocial functioning for those with schizophrenia.

1.4.4.4 Empirical studies: Emotion regulation and auditory hallucinations

Badcock, Paulik and Maybery (2011) investigated the relationship of emotional regulation strategies and auditory hallucinations by comparing voice hearers with psychosis with healthy controls. It was found that the psychosis sample did not differ from controls in the use of reappraisal or expressive suppression, however they did show significant differences with greater use of worry and rumination as emotional regulation strategies. However, the use of expressive suppression was associated with greater auditory hallucination severity (frequency, duration, loudness) and life disruption (community functioning). Rumination, but not worry, was found to be associated with greater depression and hallucination distress.

1.4.4.5 Treatment outcomes using suppression-based and distraction interventions for hearing voices

In the treatment literature there have been attempts to use thought suppression and distraction techniques as ways of managing psychotic symptoms. For example, the use of sub-vocal distraction techniques have been suggested by a number of authors to be useful in the management of auditory hallucinations, but such techniques have found to be difficult to generalize from training environments and do not appear to have long-lasting effects (Gallagher, Dinan & Baker, 1995; Margo, Hemsley & Slade, 1981; Nelson, Thrasher & Barnes, 1991). The use of aversive conditioning techniques in suppressing auditory hallucinations have been found to produce mixed results (e.g., Alford and Turner, 1976; Weingartner, 1971), with the possibility that such interventions produce a reduction in the verbal reports of hallucinations but no reduction in actual frequency or intensity of hallucinatory experiences (Falloon & Talbot, 1981). More broadly, it appears that there is little evidence for teaching distraction as an effective way to manage psychotic symptoms (Crawford-Walker, King & Chan, 2005).

In addition, it may be that interventions for distressed voice hearers that teach distraction-based coping come at personal cost: Haddock, Slade, Bentall, Reid and Faragher (1998) compared two

treatments that used distraction (blocking voices through alternative activity) and focusing (encouraging patients to focus on or expose themselves to their hallucinations) in the management of auditory hallucinations, with a follow-up period of two years. Although no differences were found between the groups for outcome on symptom severity, it was found that during treatment patients in the focusing intervention had increases in self-esteem while those in the distraction intervention had a decrease in self-esteem. In addition patients in the focusing intervention showed a greater belief that their voices were their own thoughts at final follow-up. When both treatments were combined there was a significant reduction in the frequency of hallucinations and disruption to life caused by voices during the treatment, however this result was not maintained at follow-up.

1.4.5 Summary of Coping and Emotional Regulation in Voice Hearers

The limitations within the coping literature are that studies have used a variety of methods to elicit the natural coping methods used by people who hear voices, and so there are likely to be differences between the results that are due to methodological differences. Similarly samples have varied, with studies having differing proportions of people with schizophrenia spectrum diagnoses, durations of mental health problems, those in inpatient or community treatment settings. With some exceptions (e.g., Romme & Escher, 1993), studies have involved voice hearers who have received mental health treatment: there is a bias in these samples as their membership is of those who have not successful coped with auditory hallucinations and other intrusive, unusual experiences. Thus, it may be difficult to identify effective coping methods or the contexts that promote their use.

In addition many studies have been descriptive, developing lists of coping methods, which are then classified along topographic lines or based upon previous classifications that have assumed differences between methods that involve overt and covert behaviour (i.e., cognitive methods), for example. Only a minority of studies have used factor analytic methods and theoretical frameworks to investigate the underlying constructs within coping in psychosis.

However, while taking these limitations into account, there are several conclusions to be drawn from the literature on coping with auditory hallucinations, and general symptomatic coping for psychosis.

These studies suggest that:

1. People typically use a number of natural coping methods, associated with varying effectiveness. A larger repertoire of coping strategies may be associated with more effective coping, however, for the range of strategies the relative effectiveness of particular coping methods has not been consistently demonstrated (with the exception of suppression, distraction and acceptance discussed below).

2. People use similar styles of coping with auditory hallucinations as with emotions and other experiences; it may also be that people with psychosis use similar regulation strategies as the general population. However, the use of distraction or suppression, while understandable and normative, may not be as effective as other ways of coping with voices, and may reduce resilience toward negative experiences.

3. When auditory hallucinations are a negative experience, trying to suppress the voices is associated with poorer outcomes, particularly if other strategies are also used less frequently. The habitual use of suppression as an emotion regulation strategy is associated with poor functioning for those with psychosis, and may be implicated in the maintenance of symptom proneness, frequency and distress. This reflects similar outcomes for suppression in the general population from the emotional regulation literature (Gross, 2002; John & Gross, 2004).

4. Symptom-focused coping is less effective than active efforts to engage with personal goals and social roles. Choosing what to do independently of the voices is more workable long-term than coping through using suppression, avoidance, or focusing on auditory hallucinations (which may involve a focus on trying to control or limit the experience at the cost of personal goals: experiential avoidance, discussed in Chapter 2).

5. coping methods that involve the active acceptance of experience may present an alternative to symptom-focused coping/ resistance and engagement

1.5 Acceptance as a coping method

As outlined earlier, acceptance toward auditory hallucinations has long been suggested as a potentially effective coping strategy (e.g., Falloon & Talbot, 1981; Romme & Escher, 1993). The arguments above suggest that there may be a role for the use of acceptance-based interventions to reduce unhelpful avoidance, thought control and suppression strategies in psychosis, and therefore possibly reduce the influence that such experiences exert on functioning. It may be that those who cope poorly with auditory hallucinations may underuse acceptance.

In the literature the idea of "acceptance" has been conceptualised in two ways, as:

1) a cognitive insight or appraisal related to the origin of the experience of voices. This form of acceptance is presumed to assist the voice hearer to gain greater insight into their experience, by agreeing (accepting) a shared, socially condoned (medical) understanding of their problems, that results in less distress and preoccupation with their auditory hallucinations. It could be argued that cognitive interventions for voices can sometimes involve this form of acceptance: by accepting voices as part of an illness rather than coming from real people it is hoped that this results in improved adaptation and disengagement from voices (Chadwick & Birchwood, 1994; van der Gaag, 2006; Shawyer, Thomas, Morris & Farhall, in press).

2) an active coping style that involves present moment awareness and choice, neither attempting to control, or be guided by, the experience of auditory hallucinations (Hayes, Strosahl & Wilson, 1999; Barlow, Allen & Choate, 2004).

This second type, an active acceptance, is a central focus for this thesis, being a core process in the Psychological Flexibility Model (Chapter 2).

Active acceptance, involving a detached, non-judgemental noticing and a chosen willingness to have experiences as part of the present moment (Hayes, Strosahl & Wilson, 1999), can be

contrasted with engulfment in symptoms, involving resignation to voices. Non-judgemental acceptance also encompasses the relationship with appraisals of experiences, the person responding to automatic evaluations from a dispassionate stance (Baer et al., 2004). The use of acceptance therefore involves a disavowal of strategies aimed at controlling emotional experience, an allowance of feelings and their processing, limiting experiential avoidance as a habitual mode of coping (Segal, Williams & Teasdale, 2002). Through this mindful action a person may be able to step back from distressing auditory hallucinations, gain perspective and permit feelings to emerge that provide direction for action, thus breaking the maladaptive use of control (Chadwick, 2006; Hayes, Strosahl & Wilson, 2012).

1.6 Relating to voices: appraisals of power, intention and social rank

Cognitive models of auditory hallucinations hold central the appraisal of voices as an important factor in influencing how people cope with this experience. Consistent findings demonstrate associations between appraisals of voices, and voice hearers' affect and behaviour, which are not accountable by the presence of auditory hallucinations or their content alone (Birchwood & Chadwick, 1997; Chadwick & Birchwood, 1994; Peters, Williams, Cooke & Kuipers, 2011; van der Gaag, Hageman and Birchwood, 2003).

Chadwick and Birchwood (1994, 1995) demonstrated that there are substantial variations in voice hearers' relationships to their voices, which are associated with appraisals of the voice intentionality (malevolence, benevolence). Chadwick and Birchwood (1994) described two behavioural responses to voices as a means of coping: engagement (elective listening, willing compliance, doing things to initiate voices) and resistance (arguing, non- or reluctant-compliance, avoidance of voice cues, distraction). Subsequent studies have found that resistance to auditory hallucinations is associated with malevolence appraisals, depression and anxiety (Birchwood & Chadwick, 1997; Chadwick, Lees & Birchwood, 2000; Peters et al.,2011; Sayer, Ritter, and Gournay, 2000; van der Gaag, Hageman and Birchwood, 2003;), as well as appraisals of voice omnipotence (Birchwood & Chadwick, 1997) and voice-associated distress (Peters et al.,2011). Similarly it has been consistently found that people who engage with their voices tend to appraise them as

benevolent (Chadwick, Lees and Birchwood,2000; Peters et al.,2011; So & Wong, 2008), and engagement is negatively associated with depression and anxiety, as well as omnipotence (Birchwood & Chadwick, 1997; Chadwick, Lees and Birchwood, 2000). Appraising a voice as powerful (omnipotent) has also been found to be associated with compliance with command hallucinations (Beck-Sander, Birchwood & Chadwick, 1997; Braham, Trower, & Birchwood, 2004; Fox, Gray & Lewis, 2004;). People who appraise their voices as malevolent and negative in content tend to experience greater distress and report higher levels of suicidal ideation, than those whose voices are appraised as benevolent (Fialko et al., 2006).

1.6.1 Social ranking and auditory hallucinations

Further research has been conducted to understand voice hearers' responses from the framework of evolutionary theory (Gilbert & Allan, 1998). A prediction from social ranking theory is that stimuli perceived as powerful and threatening (such as auditory hallucinations), can activate self-protective responses, including submissive and escape behaviours (Birchwood et al., 2000). Gilbert & Allan (1998) posit that the appraisal of social subordination is influenced by a process of social comparison which serves the formation of social ranks; Birchwood et al (2000) hypothesised that voice hearers who perceive themselves to be of lower rank and entrapped by their voices would be more depressed than those who did not.

Birchwood, Meaden, Trower, Gilbert, and Plaistow (2000) found that feelings of subordination toward others in general predicted voice hearers' subordination toward the voices, appraisals of voice as powerful, and greater hallucinatory distress. Gilbert, Birchwood, et al. (2001) then investigated the role of dominant and subordinate behaviours in relation to auditory hallucinations, comparing people with psychosis who hear voices with a sample of depressed participants. There were no differences between the groups on how powerful they found their experiences; depression in the voices group was associated with feeling inferior to the voice and omnipotence appraisals (replicating Birchwood et al., 2000); inferiority toward voices was associated with a general social comparison of being inferior to others, and a sense of entrapment. The power of the voice was directly related to depression, when this sense of entrapment was

controlled for. Gilbert et al (2001) suggest that distressed voice hearers have a relationship to their voices as angry subordinates, unwilling to subordinate themselves but also thinking they cannot easily defeat the voices. An implication from these studies is that underlying social schemata may mediate the relationship between appraisals of voice omnipotence and malevolence, and hallucinatory distress.

1.6.2 Summary and Implications

There is a growing body of evidence that demonstrates that appraisals of auditory hallucinations are associated with depression, anxiety, voice-related distress and responses to voices. The experience that voice hearers have with their hallucinations can be usefully described as a *relationship* and evidence suggests that this relationship is influenced by prior learning and context: people who relate to others in a submissive manner also tend to relate to their voices in a similar way. Beliefs about the power of a voice as well as its intentionality appear to play a role in whether this experience is engaged with, or resisted.

There may be value in taking a contextual view of responses to voices, considering the situational influences on how a person responds to distressing and/or commanding voices: resistance and engagement are currently measured in a trait-like fashion, although it is likely that these responses are more variable (e.g., Sayer, Ritter, and Gournay, 2000) and layered. For example, a person may resist a voice by partially complying, i.e. choosing to act on a less harmful or socially unacceptable command in order to appease the voices (see Barrowcliff & Haddock, 2010 for a discussion in relation to command hallucinations). Engagement and resistance are based on clinical observations about the function of behaviour in the context of hearing voices, and while it has been found that there is a clear factor structure for these constructs (Chadwick & Birchwood, 1995), it is likely that there are other ways of responding to voices, such as active acceptance that are not currently measured in research studies (see discussion earlier in the review of coping, and Mawson, Cohen & Berry, 2010 for a review).

1.7 Cognitive Behavioural Therapies for Psychosis

Based upon the cognitive models of the positive symptoms of psychosis (described earlier), cognitive behavioural therapy for psychosis (CBTp) has been the focus of development, particularly within the United Kingdom (Wykes, Steel, Everitt & Tarrier, 2008). Based upon the evidence for efficacy of CBTp, the UK National Institute for Clinical Excellence (NICE) currently recommends that CBTp is routinely offered to all people with psychosis (NICE, 2009).

CBTp has been used as an adjunctive treatment in schizophrenia and psychosis, in combination with medication; recent research suggests that CBTp may be effective for those who choose not to take antipsychotic medication (Morrison et al., 2011). In clinical practice, CBTp is the contemporary evidence-based psychological approach to help people distressed and disabled by auditory hallucinations (e.g., Penn et al., 2009; Trower et al., 2004; Wykes et al., 2005;).

1.7.1 Models

CBTp is an application of a generic cognitive model (Beck, 1976), toward the understanding of the problems of psychosis. This model proposes that the way that people appraise events has consequences for what emotions they feel and their actions, and that these appraisals are maintained by unhelpful thinking biases and behavioural responses. The model also suggests that appraisals are influenced by core beliefs (schemas), formed from life experiences. For psychosis, as discussed above in Section 1.3, the extension of the cognitive model suggests that it is not the prime experiences of psychotic phenomena that cause distress and disability, but rather the appraisals (or meaning) of these experiences (Tai & Turkington, 2009). Thus, for example, it has been found that the impact of auditory hallucinations and anomalous experiences can be accounted for by unhelpful appraisals, rather than their presence alone (Brett et al., 2007; Peters, Williams, Cooke & Kuipers, 2011). CBTp models formulate how positive symptoms of psychosis occur when anomalous experiences that are commonly experienced in the population (Johns & van Os, 2001) are mis-attributed in a way that has a threatening and/or highly important personal meaning (Garety, Kuipers, Fowler, Freeman, Bebbington, 2001; Morrison, 2001; Tai & Turkington, 2009)

1.7.2 Components of CBTp

CBTp is characterised by a variety of therapeutic approaches and theoretical bases (Morrison & Barratt, 2010). This heterogeneity of intervention components of CBTp (Turkington, Kingdon and Chadwick, 2003)and the research emphasis on large-scale randomised controlled trials has made it difficult to identify the active ingredients to increase the efficacy and efficiency of the intervention (Birchwood & Trower, 2006).

Lecomte and Lecomte (2002) described the specific and non-specific factors that may contribute to the effectiveness of CBTp, noting that at the time there were limited findings about these factors. They suggest effective change in CBTp is influenced by the therapeutic alliance; training and personal qualities of the therapist; client characteristics such as capacity for insight, motivation and cognitive flexibility (e.g., Garety et al., 1997); and elements of the CBT approach that emphasise learning new skills and patterns, promoting alternative understandings of unusual experiences, normalization, and the use of cognitive reframing.

Morrison and Barratt (2010) describe an effort to develop a consensus from the expert community on the important components of CBTp - as well as a number of generic therapeutic elements, there was consensus on the importance of a number of reappraisal-based methods, such as identifying and working with beliefs about auditory hallucinations, modifying core beliefs/ schemas, setting up behavioural experiments to test beliefs and modify safety behaviours, and finding alternative explanations for unusual experiences. Tai and Turkington (2009) report a trend in CBTp development for approaches that incorporate mindfulness, metacognitive awareness, attentional training and compassionate practices, reflecting broader contextual developments in cognitive and behavioural therapies (Hayes, 2004; described in detail in Chapter 2). A number of these developments are being incorporated as additions/ augmentations of CBTp in clinical practice (Gaudiano, 2005; Tai & Turkington, 2009).

1.7.3 Current status of the evidence for CBTp: efficacy and processes of change

There is now a considerable amount of evidence that demonstrates the efficacy of CBTp for positive and negative symptoms, functioning, mood and social anxiety, post-therapy (Tai & Turkington, 2009; Wykes et al., 2008) as well as improved outcomes over time (Sarin, Wallin &

Widerlov, 2011). The UK National Institute for Clinical Excellence (NICE), based upon the evidence from efficacy and effectiveness studies, has recommended CBTp as a treatment for schizophrenia (NICE, 2002, 2009).

A meta-analysis by Wykes, Steel, Everitt and Tarrier (2008) reported a moderate effect size (0.4; 95% CI = 0.252, 0.548) which dropped to a small effect size when only CBTp trials deemed 'methodologically rigorous' were included (estimated effect size = 0.223; 95% CI = 0.017, 0.428). This meta-analysis was more rigorous than earlier reviews due to the use of weighted effect sizes, the inclusion of all eligible trials, and greater consideration of the methodological variability of the trials (e.g., Gould, Mueser, Bolton, Mays & Goff, 2001; Pfammatter, Junghan & Brenner, 2006; Pilling, Bebbington, Kuipers, Garety, Orbach & Morgan, 2002; Rector & Beck, 2001). Included in this meta-analysis was the trial of Acceptance and Commitment Therapy by Gaudiano and Herbert (2006); studies were rated independently by the degree to which they emphasised behavioural versus cognitive components, with a non-significant trend toward effect sizes being greater for studies that were more behavioural in emphasis (Wykes et al., 2008). While a number of meta-analyses show that CBTp produces robust, if moderate effects (Pfammatter et al., 2006; Pilling et al., 2002), there has also been criticism of the methodological rigour of these reviews (Lynch, Laws & McKenna, 2010) and lack of comparisons with supportive therapy approaches to determine efficacy (Newton-Howes & Wood, 2011). Favourable effect size gains have been shown for CBT for psychosis compared to treatment as usual, although there are less robust and specific benefits when compared to non-specific supportive interventions (Gaudiano, 2005). Related to this latter point, a recent Cochrane review (Jones et al., 2012) has concluded that CBTp is not any more efficacious than other psychological interventions for schizophrenia.

1.7.4 Moderators and Mediators of cognitive behavioural therapies for psychosis

There is a small and developing literature on potential predictors of CBTp treatment response, with factors identified such as the person displaying cognitive flexibility toward delusions (Garety et al., 1997), and holding a psychological view of problems and the potential to gain control (Freeman et al., 2012).

Based on the cognitive models described earlier, there are several processes that could be hypothesized to mediate improved outcomes in CBTp: the externalizing appraisal of anomalous experiences; unhelpful appraisals (such as power of voices); reasoning biases; reliance upon safety behaviours and avoidance; self and social schemata; metacognitive beliefs and perseverative thought processes, amongst others. It has been observed that while appraisals of voices are a central target of CBTp, there have been inconsistent outcomes regarding altering these appraisals and subsequent reductions in voice-related distress (Mawson, Cohen & Berry, 2010 for a review).

There is limited evidence of process changes in CBTp mediating therapy outcome (Klingberg et al., 2010). Several studies have been conducted: Hodgekins and Fowler (2010) report that in a recovery-focused CBTp increases in positive beliefs about self (schemas) were found to mediate improvements in activity; while Garety et al (2008) report that changes on insight, schemas or reasoning were unrelated to outcome in their large-scale CBTp symptom reduction and relapse prevention trial. Kumari et al. (2011) report that symptom reduction in CBTp may be mediated through changes in threat processing at a neural level.

1.7.5 Summary on CBT for Psychosis

Cognitive behavioural therapies for psychosis have a developing evidence base, with estimates of modest effects for reducing the intensity of psychotic symptoms and distress; it is contested whether CBTp out-performs other psychosocial interventions for psychosis. There are a small number of studies that have identified predictors of treatment response or investigated process changes that link with outcome.

Treatment packages in CBTp show substantial variance in emphases and methods, while remaining consistent with a broad cognitive model of psychological distress. It may be that this variance in procedures, as well as the heterogeneous populations recruited in research trials, has led to the modest effects suggested by meta-analyses. CBTp benefits from the development of increasingly refined psychological models of symptoms (consistent with the single-symptom approach) that may result in greater precision of interventions that change processes associated with distress and disability. There is a current trend toward the incorporation of metacognitive and contextual/

mindfulness-based methods within CBTp, with these interventions being included in meta-analyses. Contemporary cognitive models of psychotic symptoms, however, do not (yet) incorporate processes that may be influenced by mindfulness, such as experiential avoidance or non-judgemental acceptance (discussed in the next chapter).

1.8 Chapter Implications

The development of an empirical psychological understanding of auditory hallucinations has demonstrated the importance of how people make sense of their experiences (appraisal) and what actions they take in response to them (coping; regulation strategies; efforts to engage, resist, comply, suppress, or accept voices). These two broad factors are implicated in how effectively people manage the experience of hearing voices, and are a focus for intervention when voice hearers are engaged in cognitive behavioural therapy.

There are (at least) two areas that this chapter highlights as being of empirical interest: the potential of acceptance as a broad-based strategy to foster in distressed voice hearers, and further investigation of the processes of change in cognitive behavioural therapies for psychosis.

In contrast to responding to voices either by resisting or engaging, active acceptance may be a functionally different response, that is not symptom-focused, nor places the voice hearer in a subordinate position to their experiences; the broader literature regarding acceptance will be reviewed in Chapter 2, as part of the Psychological Flexibility Model.

In addition, Chapter 2 will review how a contextual approach provides a strategy to researching the processes of change in psychological therapies, and the implications of this for cognitive behavioural therapies for psychosis.

Chapter 2

Contextual Behavioural Science, Functional Contexualism & Relational Frame Theory

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This chapter will review the background for Acceptance and Commitment Therapy: contextual behavioural science, functional contextualism, Relational Frame Theory and the Psychological Flexibility Model.

2.1 Contextual Behavioural Science

The research conducted for this thesis is presented as consistent with a contextual behavioural science (CBS) approach.

Contextual behavioural science is the descriptive term for "a naturalistic, inductive approach to system building in the behavioral sciences that emphasizes the evolution of historically and situationally embedded action, extending that unit across levels of analysis and into knowledge development itself" (Hayes, Strosahl & Wilson, 2012, p.356). CBS is an extension from behavioural analysis and is based upon *functional contextualism* as a philosophy of science (Vilardaga, Hayes, Levin & Muto, 2009). The features of a contextual behavioural science approach include: unified models; an explication of trans-diagnostic processes and processes of change; and the use of methods that are based more on changing the function of psychological events (cognition, emotion) than their particular form or frequency (Hayes, Villatte, Levin & Hildebrandt, 2011). These features are reflected in developments of Relational Frame Theory, the Psychological Flexibility Model, and Acceptance and Commitment Therapy.

2.2 Functional Contextualism

"In practice, all these ways of changing a man's mind reduce to manipulating his environment, verbal or otherwise" B.F. Skinner, 1969, p. 239.

In this section I will discuss the tenets of functional contextualism, contrast with mechanistic assumptions, and present the implications of contextualist stance for the development and practice of psychological interventions

Functional contextualism is a philosophy of science that underpins applied behaviour analysis, and can be seen as a contemporary description of radical behaviourism (Biglan & Hayes, 1996; Gifford & Hayes, 1999). Skinner (1953) stated, in a declarative fashion, that the purposes of science were prediction and control; subsequently other radical behavioural theorists have argued that these purposes can be regarded as an assumptive stance (e.g., Hayes, 1993). The term "functional contextualism" points to two essential elements in radical behaviourism: 1) that behaviour must be understood in terms of its context, and 2) that studying the function of behaviour is important in order to understand and influence it (Torneke, 2010). Radical behaviourism is a bottom-up, inductive science that has the goal of developing fundamental, universally valid principles for understanding behaviour (Torneke, 2010).

Functional contextualism can be contrasted with the dominant philosophy that underpins most of mainstream psychology, mechanism (Morris, 1993). Although some may find the term "mechanism" has a pejorative connotation, it simply describes a philosophy that specifies a root metaphor and truth criterion to create a system for evaluating knowledge (Biglan & Hayes, 1996; Chiesa, 1998; Smith, 1986).

Functional contextualism has roots in philosophical pragmatism (e.g., James, 1907), and has a pragmatic truth criterion. Functional contextualism begins with the assumption that the world is an undivided and undistinguished whole, which humans partition through our interaction in and with it (Hayes, 1993; Vilardarga, Hayes, Levin & Muto, 2009); from this stance the world is considered "real", but as organisms interact with it, the world becomes non-arbitrarily structured in multiple ways. Importantly, science to a functional contextualist is not ontological: analyses do not reveal the "true" nature of the universe. To a functional contextualist science is not the only valid form of knowing, and does not provide complete objectivity in the analysis of events.

Instead, the value of science is in its *usefulness*, in enabling humans to interact with the world more effectively through the development of general rules and principles. As a philosophy of science this pragmatism needs to be linked to assessable claims, and analytic goals need to be established *a priori* since this makes sense of any epistemological effort to build knowledge and produce change (Vilardarga et al., 2009).

Functional contextualism can be related to other forms of contextualism, such as social constructivism (Barnes-Holmes & Roche, 2003), in terms of the indivisibility of the whole event and knowledge being considered in terms of purpose, although there are also differences, particularly regarding the purpose of analyses (Hayes, 1987). Contextualism as a philosophical world view was described by Stephen Pepper in his book *World Hypotheses* (Pepper, 1942), which demonstrated that it is a fallacy to consider that there are no data that are free of interpretation (the central error of logical positivism). Pepper (1942) posited that root metaphors (an underlying worldview that shape understanding of a situation) are necessary in epistemology, and outlined what he considered to be four adequate world hypotheses (conceptual systems): formism, mechanism, contextualism, and organicism. Pepper (1942) argues that each of these philosophical systems is qualitatively distinct and adequate in its own right, without reflecting on the adequacy of the others. Pepper determined "adequacy" by two features of each philosophy: scope (the ability to explain everything) and precision (explaining uniquely and not vaguely).

The analytic goal of functional contextualism is the prediction and influence of psychological events, and the method is a focus on the manipulable variables in the context of psychological events (the act-in-context). Functional contextualists therefore study how people's history of interacting with their environment affects their psychological events in the current setting and simultaneously work to influence these psychological events. The root metaphor and truth criterion of functional contextualism therefore are dependent upon the purpose of the analysis. This means the act-in-context is meaningful only in terms of the explicit goal; similarly the truth criterion of successful working can only be judged in relation to the achievement of a stated objective. Functional contextualists seek the development of empirically based concepts and rules that allow psychological phenomena to be predicted and influenced with precision, scope, and depth (Hayes, 1993).

2.2.1 How behaviour and context are defined

Functional contextualism maintains the definition of behaviour that is the hallmark of radical behaviourism, separating it philosophically from other forms of behaviourism: behaviour is defined as any and all activity that anyone (and possible only one person) can observe, predict and influence (Skinner, 1945). This definition means that private experiences, which can only be observed by the person themselves such as thoughts, feelings, urges and sensations, are considered behaviours. This distinction has been present in radical behaviourism since Skinner (1953), contrasting this philosophy of science with forms of "black box" behaviourism, such as S-R learning theories (e.g., Hull, 1954; Thorndike, 1932). The "radical" in radical behaviourism relates to the consistency of the philosophy, which extends to the behaviour of the scientist as well (Leigland, 2010; Torneke, 2010). In radical behaviourism the activity of the scientist is also under contextual control, and thus scientists do not have a "god's eye", or objective, view in their analyses; they are also part of the context that is being functionally analysed (Skinner, 1953, 1974).

The act-in-context is considered as a single unity (Kantor, 1970), as behaviour cannot be understood without studying its context. The context therefore is the situational and historical variables that allow for the prediction-and-influence goal to be met. Situational variables include the current setting or environment in which an event occurs (including physical, social, biological and cultural features); historical variables relate to a person's lifelong history of interacting with his or her environment. The meaning, purpose and function of an action is determined by past events, that is by historical context.

2.2.2 Influence: an emphasis on manipulable contextual variables

Hayes (2004) argued: "If one adopts "prediction and influence" as a unified goal (ie., if principles and theories should help accomplish both simultaneously), then it is logically necessary for analyses to include manipulable contextual variables…. While analyses that begin and end in the domain of psychological dependent variables (e.g., emotion, thought, overt action) can achieve

good levels of prediction, a gap necessarily exists between these analyses and the actions that might change psychological events" (p. 9)

The implications of the prediction-and-influence analytic goal are:

1) An emphasis on environmental and historical variables

The therapist/ scientist is part of the other person's environment: anything that they may do to influence the learning or performance of an individual occurs in the environment of the individual (the context of their behaviour). Developing theories that directly help the therapist/scientist to influence the learning or performance of others must therefore include environmental or historical variables (NB. "historical" in essence means a consideration of the individual's learning history)

2) An emphasis on experimental methods

Isolating the contextual features that are related in the changes in the psychological event requires controlled experimentation. Correlational or descriptive research may provide some clues to these contextual features, which then need to demonstrate a functional relationship through experimentation, also verifying the general utility of the principles.

2.2.3 Contrasting Functional Contextualism with the dominant philosophy of mainstream psychology: Mechanism

As described above, Mechanism is a description of the world hypothesis that much of mainstream psychology and science in general operates within (Chiesa, 1998; Walls, 1982). The above discussion hopefully has highlighted to the reader that functional contextualism differs from mechanism in a number of fundamental ways. Table 2.1 below describes the defining features that contrast mechanism and functional contextualism.

Table 2.1 Philosophical characteristics of Mechanism & Functional Contextualism (based upon Pepper, 1942 and Biglan & Hayes, 1997)

Characteristic	Mechanism	Functional Contextualism
Truth criterion	Correspondence: truth is found through the construction of statements and formulae that reveal via predictive verification, the assumed organisation of the universe	Successful working: what is regarded as true is what is pragmatic. Statements about the world are judged in terms of their ability to achieve goals,
Goal	To produce accurate models of the world	To act effectively
A priori assumption	The universe is organised into events, relations, parts and forces.	The universe is One; acts-in-context
What is regarded as a cause?	Events that regularly precede what we are trying to explain	Ways of speaking that accomplish ends: analyses that focus on manipulable environmental variables
Root metaphor	The machine	Act-in-context

2.2.4 Causes in functional contextualism (FC)

Functional contextualists are interested in the historical and situational contexts that give rise both to thoughts and their mutual relation to emotions and actions. The monism of functional contextualism (Martell, Addis & Jacobsen, 2001) means that all psychological events are analysed as acts-in-context, where the whole is primary. During a functional analysis when we may consider the act-in-context in parts, these parts are considered secondary (e.g., such as the antecedent-behaviour-consequence relation in behaviour analysis) and do not have an ontological status. Rather, such analyses are merely constructions or *ways of speaking* (Hayes, Hayes & Reese, 1988) that may or may not serve the analytic goal. Therefore truth is tied to practical consequences, rather than ontological assumptions. Therefore contextualists regard causes as *ways of speaking to accomplish ends*, rather than considering causes as existing independently of context (Hayes, Strosahl & Wilson, 2012).

2.2.5 The implications of a FC stance for psychological interventions

Functional contextualism as an underlying philosophy extends beyond the application of psychological therapies: there will be brief discussion in Section 2.3.3 below of these wider applications, based upon Relational Frame Theory.

The implication of this stance means that functional analyses must start with considering the changeable contexts of behaviour, and for clinicians to accept that they are part of context that they wish to change. The clinician is interested in the functional relations between changeable contextual features and the behaviours these are integrated with (Hayes, Strosahl & Wilson, 2012). Therefore a contextual clinician rejects the idea that thoughts and feelings cause actions, as they are all considered to be dependent variables: rather, the interest is in which contexts select for this type of relationship between thoughts, feelings and action (Hayes & Wilson, 1995), and how this context can be altered so that different functional relationships help the client achieve their goal(s).

As an example, consider the role that unhelpful beliefs play in clinical disorders (e.g., Beck, 1993). From a contextual stance a belief is conceptualised as being an act in context (Hayes, Strosahl & Wilson, 1999), i.e., the behaviour of *believing* rather than having a belief as a discrete entity. Rather than assuming that beliefs are causal in subsequent behaviour the therapist would investigate the contextual relationship between internal events (such as thoughts and feelings), observable behaviour and the contingencies operating in this relationship Thus, it may be that unhelpful thinking and believing play a causal role in subsequent behaviour, but it may also be that thinking plays no direct role or may be an outcome of contingency-based behaviour or respondent conditioning (Kohlenberg & Tsai, 1991).The therapist helps the client to change the context of their problems by altering the functional relationships between antecedents, behaviour (including thoughts and beliefs), and consequences.

Defined in this way, psychological intervention is essentially a verbal enterprise on the part of the therapist to help the client alter the context for their problems. According to this viewpoint it is important to focus on what can actually be changed within an intervention. A contextual criticism of cognitive models is that beliefs are not entities that can be directly changed; rather it is through the changing of verbal behaviour, the environment, or a person's behavioural repertoire that effective intervention occurs (Hayes & Wilson, 1995). This forms the philosophical basis for

Acceptance and Commitment Therapy (ACT) and other interventions considered as contextual behavioural therapies (Hayes, Villate, Levin & Hildebrandt, 2011), such as contemporary Behavioural Activation (Martell, Addis & Jacobsen, 1999), Functional Analytic Psychotherapy (FAP; Kohlenberg & Tsai, 1991), and Dialectical Behaviour Therapy (DBT; Linehan, 1993).

2.3 Relational Frame Theory

Relational frame theory is a comprehensive contextualistic account for human language and cognition, that provides the theoretical rationale for acceptance and commitment therapy, but extends beyond psychotherapies to other applied areas, such as education (e.g., Cassidy, Roche & Hayes, 2011), prevention (Biglan, 2004) and social change (Biglan, 2009; Dixon, Dymond, Rehfeldt, Roche, & Zlomke, 2003; Lillis & Hayes, 2007;).

Relational Frame Theory (RFT) is a post-Skinnerian conceptualisation of human language, which conceptualizes language and cognition as forms of relational responding (learning to respond to one event in terms of another) (Hayes, Barnes-Holmes & Roche, 2001). RFT is based on the premise that such *derived relational responding* is a historically established overarching class similar to generalized imitation (Hayes, 1994), and represents a particular type of operant conditioning. To date, it appears that the learning process of derived relational responding is only present in humans possessing a capacity for language (Blackledge, 2003; Hayes, Barnes-Holmes & Roche, 2001; Torneke, 2010).

This means that humans can come to respond to stimuli not solely based on their formal properties but rather on a history of reinforcement for the application of a particular relational response, behaviour called “arbitrary applicable relational responding” (Pistorello, Follete & Hayes, 2000). This powerful form of behaviour is explicitly rewarded by the verbal community, and once it emerges it is maintained by the instrumental value of relating and the effects of coherence and sense-making. If relational networks are internally coherent people feel confident that they understand, and because such understanding does often predict an ability to control events, sense-making becomes a proxy variable for instrumental success (Hayes, 2002).

2.3.1 Relational framing and experiential avoidance

According to RFT, such instrumental success does not necessarily extend to altering internal experiences such as thoughts, memories, emotions and urges. In this area relational framing (verbal relating) can actually lead to greater distress as sense-making and the use of control may not make internal events more predictable and controllable, but may paradoxically result in the opposite. This is because verbal relations are bi-directional (discussed below), which makes self-knowledge useful, but also makes it painful (Hayes, Strosahl & Wilson, 1999). Humans persist in such experiential avoidance due to the reinforcement that they have received from the verbal community and sense-making, which results in experiential avoidance being a form of rule-governed behaviour (Hayes, 1989), the result of which can make organisms relatively immune to the non-verbal contingencies of their behaviour.

RFT argues that derived relational responding emerges from both a genetically evolved capacity and a history of reinforcement from the verbal community (Hayes, Strosahl & Wilson, 2012). Relational framing is a behaviour that is acquired and brought under the control of arbitrary contextual features through reinforcement of approximations in multiple exemplar training (Hayes, Strosahl & Wilson, 2012); an example of this in natural language learning is the behaviour of naming, where the child is reinforced through thousands of examples for derived relations (e.g., pointing to mother when hearing “where’s mother?”, and gaining social approval when doing so).

2.3.2 Characteristics of language and arbitrary applicable relational responding

Derived relational responding involves the ability to relate stimuli in a variety of ways even though a person has never been reinforced for relating those stimuli in those specific ways (Blackledge, 2003). Derived relational responding therefore means that stimuli are being related without direct training. An extension of this is *arbitrary applicable relational responding*, where learned relational responding can come under the control of arbitrary contextual cues, not solely the formal properties of what is being related nor direct experience with them (formal properties are those that can be experienced with the senses, such as size, shape, smell and taste).

A RFT definition of language is: “the process of arbitrarily applicable derived relational responding that is non-arbitrarily applied” (Blackledge, 2003). The term “non-arbitrarily applied” refers to the observation that the social environment only reinforces relational responses to certain arbitrary stimulus properties in certain contexts (Blackledge, 2003). So, for example, the social environment discriminates what “makes sense” in terms of relational responding, so that certain relations are rewarded while others are not (i.e., what is regarded as coherent not arbitrary).

Barnes-Holmes, Hayes and Roche (2001) describe relational framing as a learned behaviour that shows four processes under arbitrary contextual control - relational responding, mutual entailment, combinatorial entailment, and transformation of the stimulus function.

This is illustrated in Figure 2.1 below, with an example.

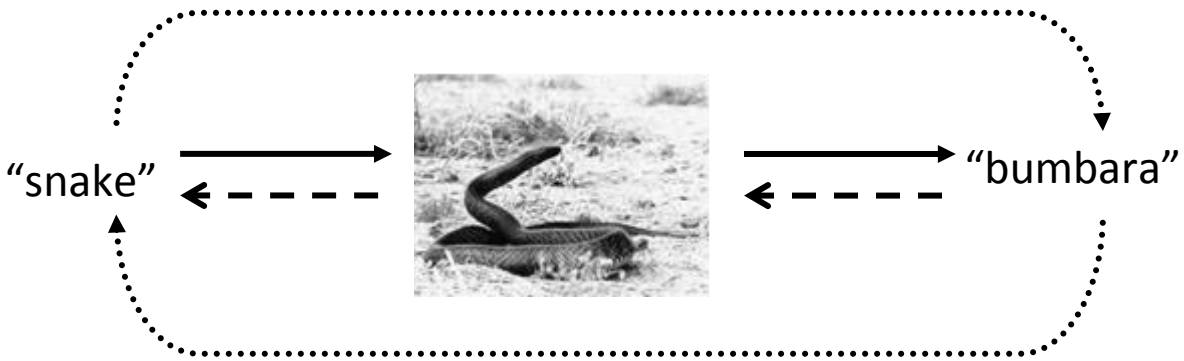
1) Relational responding - this means that what is responded to is the relation between two stimuli, rather than each stimulus separately

2) Mutual entailment - this means that a relation learned in one direction entails another in the opposite direction (Blackledge, 2003; Hayes, Strosahl & Wilson, 2012). In Figure 2.1 the relation of word “snake” to an [image of a snake] is learned directly, and the relation in the opposite direction is derived, so that [seeing a snake] is derived as the name “snake”.

3) Combinatorial entailment - refers to the reciprocal relationships that exist between two stimuli by virtue of how these stimuli are related to other, intermediary stimuli (Blackledge, 2003). It means that mutual relations can combine (Hayes, Strosahl & Wilson, 2012). In Figure 2.1 the relation learning that [image of a snake] is related to the word “bumbara”, also means that the relation of “bumbara” and “snake” is derived. (“bumbara” is a word from the language of the Gunggari people of Western Queensland, Australia)

4) Transformation of Stimulus Functions - when two sets of stimuli are related, some of the functions of each stimulus change according to what stimulus it is related to, and how it is related to that stimulus (Blackledge, 2003). In Figure 2.1 if a person is afraid of snakes and learns that “Bumbara” is another name for “snake”, then “Bumbara” will also have the same stimulus functions (i.e., physiological and behavioural responses of fear), due to being framed relationally in coordination with “snake”.

Figure 2.1 – Relational properties of language (Based on Torneke, 2010, p.64)



Directly trained

Mutual entailment

Combinatorial mutual entailment

**Image of a Western Taipan from:*
Pearn, J., & Winkel, K. D. (2006). Toxinology in Australia's colonial era: A chronology and perspective of human envenomation in 19th century Australia. Toxicon, 48(7), 726–737.

2.3.3 Evidence for RFT

A detailed review of the empirical evidence for RFT is beyond the scope of this thesis; the theory has produced studies that suggest that RFT is an operant (Berens & Hayes, 2007;Healy, Barnes-Holmes & Smeets, 2000;), by demonstrating the role of multiple examples in training derived relations (e.g., Luciano, Becerra & Valverde, 2007), the role that context has upon relational responding (e.g., Steele & Hayes, 1991), and how consequences influence this behaviour (Barnes-Holmes, Barnes-Holmes & McHugh, 2004). It has also been shown that derived relational responding can alter other forms of learning, such as respondent conditioning (e.g., Smyth, Barnes-Holmes & Forsyth, 2006): studies like this provide the basis for the argument that relational operants should be considered in current behavioural interpretations of complex human behaviour (Berens & Hayes, 2004; Hayes, Barnes-Holmes & Roche, 2001). There have been empirical advances based on RFT in the understanding of metaphor and analogy (Stewart, & Barnes-Holmes, 2001; Stewart, Barnes-Holmes, Hayes & Lipkens, 2002), reasoning (Stewart & Barnes-Holmes, 2004), perspective taking (McHugh, Barnes-Holmes & Barnes-Holmes, 2004;

McHugh & Stewart, 2012), and implicit attitudes and cognition (Barnes-Holmes, Barnes-Holmes, Stewart & Boles, 2011).

2.3.4 The implications of RFT for psychological therapies

As discussed above a functional contextualist view of clinical problems focuses upon those environmental factors that can be influenced by the therapist, which includes identifying contexts where language is contributing to the problem and attempting to change the context so that unhelpful relational framing has less influence over the client's behaviour. Contexts that have been identified as influential in a number of clinical disorders and problem are ones that support 1) literality (in colloquial language, taking thoughts too literally), and 2) experiential avoidance (attempts to control private experiences to the degree that these efforts cause harm). These will be discussed further in Section 2.4 on the Psychological Flexibility model.

Hayes, Barnes-Holmes & Roche (2001) describe the implications of RFT for psychotherapy and understanding psychopathology:

> 1) It is not practically viable to eliminate the cognitive processes that lead to psychopathology, as they are some of the same processes that allow verbal problem-solving and reasoning;
>
> 2) Cognitive networks cannot be logically restricted or eliminated as these networks are a reflection of historical learning processes: this is analogous to the findings that extinction inhibits but does not eliminate learned responding (Hayes et al., 2006);
>
> 3) Direct change attempts that focus on key nodes in a cognitive network create a context that elaborates the network and increases the functional importance of these nodes;
>
> 4) It is possible to reduce the impact of negative cognitions regardless of whether they continue with frequency and/ or in the same form (e.g., Gaudiano & Herbert, 2006a; Zettle & Hayes, 1986), as the impact of cognitive networks is controlled by distinct contextual features (Hayes et al., 2006)

Therefore, compared to psychotherapies that may focus on changing the form or frequency of cognitions to reduce impact, instead, the aim of RFT-based interventions is to loosen the control of verbal relations, as it assumed that these are responsible for experiential avoidance and cognitive

fusion. Hayes et al (1999) describe the main way of weakening verbal relations effectively is to alter the context supporting literal verbal processes, not by focusing upon the verbal content per se. So, verbal relations are loosened by contexts that do not support linear, analytic sense-making; do not encourage right and wrong thinking or reason-giving; do not encourage experiential control; and that support the dispassionate observation and mindfulness of verbal relations as an on-going process. The weakening of such verbal relations allows the client to be in contact with the natural contingencies of internal experiences, rather than the amplified contingencies due to experiential avoidance. The use of behavioural commitment strategies further weakens verbal relating, and allows the client choice and committed action in areas that can be verbally regulated, such as overt behaviour (Hayes, Strosahl & Wilson, 1999).

2.4 The Psychological Flexibility Model

Based upon functional contextualism and relational frame theory is the Psychological Flexibility model (Hayes, Strosahl & Wilson, 2012; Levin et al., 2012), a model of psychological health, psychopathology, and psychological intervention.

This model proposes six interrelated processes that build *psychological flexibility,* which has been defined as: "the ability to contact consciously the present moment and the thoughts and feelings it contains more fully and without needless defence, and based on what the situation affords, to persist or change in behaviour in the service of chosen values" (Hayes, Luoma, Bond, Masuda & Lillis, 2006). The six processes that have been identified as comprising psychological flexibility are: Acceptance, Defusion, Flexible attention to the present moment, Self as context, Values, and Committed action. A set of definitions for these processes is in Table 2.2 below.

Table 2.2 Core Processes of the Psychological Flexibility Model (Luoma, Walser & Hayes, 2007; Hayes, Strosahl & Wilson, 2012)

Process	Definition
Acceptance	the active and aware embrace of private events that are occasioned by our history, without unnecessary attempts to change their frequency or form, especially when doing so would case psychological harm
Defusion	the process of creating non-literal contexts in which language can be seen as an active, ongoing relational process that is historical in nature and present in the current context
Self as context (Flexible perspective-taking)	The process of developing a stronger connection with self as an aspect of the "I-here-nowness" of experience; cultivating an observer perspective
Flexible attention to the present moment	Ongoing, non-judgmental contact with psychological and environmental events as they occur
Values	Verbally-constructed, global, desired, and chosen life directions
Committed Action	The process of linking specific actions to chosen values, and building successively larger patterns of effective actions

Figure 2.2 shows the relationship of these six processes. The four processes to the left are understood as *mindfulness and acceptance processes*, while the four on the right are *commitment and behavioural activation processes* (Hayes, 2004). The diagram shows that the six processes are considered to be interrelated, so that an emphasis on increasing one process is liable to show concomitant changes in the other processes too. It is suggested that an absence of one or more these processes risks p*sychological inflexibility*, which is claimed to be a root cause of human suffering and maladaptive functioning (Hayes, Strosahl & Wilson, 2012), Psychological inflexibility, therefore, is the result of the inverse of the skills described above: experiential avoidance, cognitive entanglement/ fusion, rigid attentional processes, lack of values clarity, poor perspective taking, and rigid behavioural repertoires (Hayes, Strosahl & Wilson, 1999, 2012; Kashdan & Rottenberg, 2010).

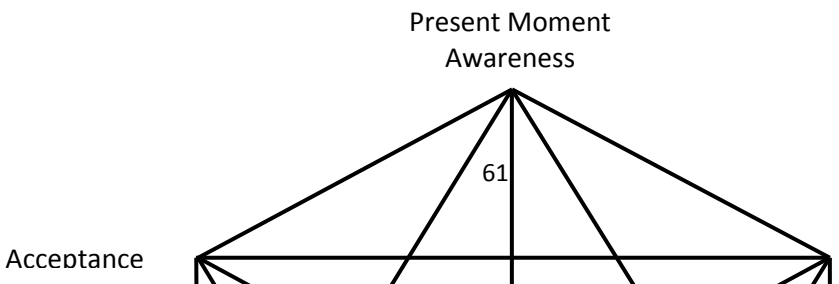


Figure 2.2 The Psychological Flexibility Model (Luoma, Walser & Hayes, 2007)

The processes described in the Psychological Flexibility Model are considered to be mid-level terms, that is not to be taken literally, but a useful clinical language to orientate the researcher and clinician to important features in the therapeutic context; there is a more technical behaviour analytic account underneath, linked to Relational Frame Theory. For example, the process of fusion is described as "contexts in which verbal transformations of function are readily occurring" (Blackledge, 2007, p. 3), conversely defusion is defined as "disrupt[ing] ordinary meaning functions of language such that the ongoing process of framing events relationally is evident in the moment and competes with the stimulus products of relational activity" (Hayes, Strosahl & Wilson, 1999, p. 74) and "[defusion] breaks down the tight equivalence classes and dominant verbal relations that establish stimulus functions through verbal means" (Hayes, Strosahl & Wilson, 1999, p. 74).

In the next section I will highlight two processes that are implicated in clinical disorders - experiential avoidance and cognitive fusion - and are suggested to contribute to psychological inflexibility.

These processes form the foci for this thesis: these are the two most empirically-developed areas of the Psychological Flexibility Model and ACT psychopathological research. Mindfulness, later outlined in this chapter, in ACT terms also implicates perspective taking and attention processes, in order to help clarify values and foster engagement in committed actions (Hayes, Strosahl & Wilson, 2012). More broadly and relevant to psychosis, there have also been a small number of studies on perspective-taking in schizophrenia (Villatte, Monestès, McHugh, Freixa i Baqué, & Loas, 2010, 2011), however interventions are still in infancy (e.g., O'Neil, 2012 unpublished thesis) and discussion is beyond the scope of this thesis.

The final part of this section is a review of the current evidence for the Psychological Flexibility Model.

2.4.1 Experiential avoidance

"*Many forms of psychopathology are not merely bad problems, they are also bad solutions" - Hayes, Wilson, Gifford, Follette & Strosahl, 1996, p. 1162.*

Experiential avoidance (EA) has been defined as "when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them, even when this process is unhelpful" (Hayes, Wilson & Strosahl, 1999). EA is the immediate consequence of following verbal rules that suggest the suppression, control, or elimination of unwanted private experiences is important to well-being (Hayes, Strosahl & Wilson, 1999).

EA is hypothesised to be involved in the development and maintenance of numerous clinical disorders (Hayes et al, 1996; Hayes et al. 2004). EA can be considered to be a generalised psychological vulnerability (Kashdan, Barrios, Forsyth & Steger, 2006); it has been proposed to be a stronger contributor to psychopathology than the content (frequency, intensity, negative

valence) of private psychological and emotional experiences (Hayes et al., 1999; Kashdan et al., 2006).

It has been proposed by Hayes et al. (1996) that EA contributes to psychopathology via three pathways:

> 1) that deliberate avoidance strategies operate as verbal rules which include the target of avoidance, as a result the target may increase in accessibility and further influence cognition and behaviour (Wenzlaff & Wegner, 2000);
>
> 2) that private experiences are often classically conditioned, and thus may not be amenable to verbal control strategies, for example as suggested by studies about the neural pathways of fear conditioning (LeDoux, 1996: cited by Chawla & Oastafin, 2007);
>
> 3) even if avoidance strategies are effective, there may be unworkable costs associated with engaging in them, such as the example of a person with paranoia avoiding leaving the house and thus not being able to work or sustain friendships.

It has been argued by Hayes et al. (1996) that an advantage of EA as a construct is that it provides a functional perspective of psychological symptoms, which is preferable to a syndromal perspective toward psychopathology. Thus EA is consistent with a transdiagnostic approach to understanding psychological problems.

Within the literature the term "acceptance" has been used to describe the opposite process to EA (Barlow, Allen & Choate, 2004; Hayes & Wilson, 1994). The action of acceptance can be described as "intentionally allowing painful psychological events to be present and felt, so as to be able to move in a valued direction" (Hayes et al., 2011).

2.4.1.1 How experiential avoidance is theorised to occur - relational framing and support from the verbal community

A necessary component of experiencing emotion is appraisal (Lazarus, 1982), an evaluative and predictive language process. Hayes et al's (1996) theory specifies that when such language processes are excessively applied to private events (such as emotions, memories and thoughts) this can promote self-focus, emotional struggle and experiential avoidance. In RFT terms

experiential avoidance is due to the bi-directional transfer of verbally established functions to private events (Hayes, Barnes-Holmes & Roche, 2001). Therefore if "anxiety," for example, is an entirely "bad" emotion, then anxiety must be avoided or suppressed to control a bad outcome. The immediate effects of experiential avoidance often appear to be positive. An example is the immediate effect of cognitive distraction or other forms of thought suppression, which usually results in a reduction of the avoided event – however, it is only over time that the avoided thought increases in frequency (Gold & Wegner, 1995). This pattern of a short term reduction leading to a long term increase, can easily establish a self-amplifying loop that might be fairly resistant to change.

Thus maintenance of experiential avoidance has been theorized to occur due to short-term negative reinforcement effects, but also as a result of reinforcement from the verbal community and the generalized effects of sense-making, which results in experiential avoidance being a form of rule-governed behaviour (Hayes, 1989). It has been found that rule-governed behaviour results in organisms being relatively immune to the contingencies of behaviour (Hayes, 1989). It can be observed that the effects of rule-governed behaviour are seen in a number of clinical disorders, where individuals persist with dysfunctional ways of coping despite the negative effects. Experiential avoidance is reinforced by the wider community, particularly in the form of beliefs about the efficacious effects of thought- and emotional-suppression (e.g., "Don't think about it", "Just get over it", the power of "positive thinking" and affirmations), and efforts to attain a state of permanent happiness (Hayes et al, 1999).

Hayes et al (1996) have argued that experiential avoidance is harmful because private events are often unresponsive or even paradoxically increased by deliberate control efforts, that many forms of experiential avoidance result in poorer functioning, that sometimes difficult emotions are experientially important, and that healthy behavioural changes often initially produce psychological discomfort. Thus, excessive experiential avoidance is likely to be associated with higher levels of psychopathology in general and a lower quality of life.

2.4.1.2 Measurement of EA

EA is considered to be a uni-dimensional construct, consistent with the definition described above and the Psychological Flexibility model. EA has been most commonly measured using a self-report measure, the Acceptance and Action Questionnaire (AAQ: version 1 Hayes, Strosahl, Wilson et al., 2004; version 2 Bond, Hayes, Baer et al., 2011, see Appendix A-2.1 and Chapter 5, Section 5.3.4 for a description of the psychometrics of the AAQ-II).

The AAQ-I was published in 9- and 16-item versions, with factor analyses suggesting that the measure had a somewhat unstable structure. The original validation study suggested a single factor for the 9- and 16-item AAQ-I (Hayes et al., 2004), but other studies found a two-factor structure (Bond & Bunce, 2003). The current, second version of the AAQ (AAQ-II) was designed to improve on the psychometric limitations of the AAQ-I, in particular, its internal consistency (Bond et al., 2011), which, potentially as a result of item complexity, may have resulted in the unstable factor structure. In the studies cited below, measurement of EA is with the original version of the AAQ.

2.4.1.3 The association of EA and psychopathology

Numerous studies have demonstrated significant relationships between EA and disability, distress and ineffective coping across disorders and populations (Bond et al., 2011; Hayes et al., 1996; Hayes & Gifford, 1997; Hayes et al., 2004; Hayes et al., 2006;). EA has been shown to be associated with general psychopathology in both clinical and healthy samples (Hayes et al., 2004) and have strong associations with measures of anxiety and depression (Bond et al., 2011; Cribb, Moulds, & Carter, 2006; Marx & Sloan, 2005; Roemer et al., 2005; Tull, Gratz, Salters & Roemer, 2004).

A meta-analysis (Hayes et al., 2006) and a review (Chawla & Ostafin, 2007) have found that EA predicts a wide range of quality of life and well-being outcomes (e.g., depression, anxiety, pain intensity, general mental health, job satisfaction, work performance), with an average effect size of r =.42. Bond, Hayes and Barnes-Holmes (2006) review studies that demonstrate that EA predicts outcomes, even after controlling for other variables, such as negative affectivity, thought suppression and locus of control. Beyond EA being associated with quality of life and well-being, it

has been found that it mediates the impact of acceptance-based interventions (e.g., Bond & Bunce, 2000), moderates the effect of interventions (e.g, Masuda, Hayes, Fletcher et al., 2007) and the impact of coping processes such as cognitive reappraisal (Kashdan, Barrios, Forsyth & Steger, 2006).

A consistent finding across studies is that EA is associated with greater impact of distressing and unwanted experiences: for example, in chronic pain psychosocial disability is predicted more by the experiential avoidance of pain than by the degree of pain (McCracken, 1998). Similarly experimental studies of anxiety suggest that EA is not merely a concomitant or consequence of anxiety, instead EA appears to be a psychological vulnerability for anxiety pathology, that is, EA appears to amplify anxiety symptoms in those who have no history of anxiety disorder (Feldner, Zvolensky, Eifert & Spira, 2003; Karekla, Forsyth & Kelly, 2004; Kashdan et al., 2006).

EA appears to mediate coping and outcomes: in reviewing the published literature Chawla & Ostafin (2007) summarise that EA appears to mediate the relationship between maladaptive coping, self-regulatory strategies, and distress. Similar EA mediation effects, for example, have been found in the relationships between current mental health and childhood psychological abuse, (Reddy, Pickett & Orcutt, 2006), adolescent sexual victimisation (Merwin, Zachary Rosenthal & Coffey, 2009; Polusny, Rosenthal, Aban & Follette, 2004); problem behaviours and childhood trauma (Kingston, Clarke & Remington, 2010); and the relationship between maladaptive perfectionism and worry (Santanello & Gardner, 2007).

Correlational studies across disorders suggest that EA as measured by the AAQ shows associations with general psychopathology, rather than symptom specific associations (Bond et al., 2011): for example, with generalised anxiety disorder (Roemer, Salters, Raffa & Orsillo, 2005) and PTSD (Tull & Roemer, 2003). As the AAQ was originally designed as a population level measure, rather than a clinical questionnaire (Hayes et al., 2004) it may be that disorder-specific experiential avoidance is not adequately captured: various EA measures have been developed that are more disorder-specific, including measures for pain content (McCracken, 1998; McCracken, Vowles & Eccelston, 2004), substance abuse (Luoma, Drake, Hayes, Kohlenberg, 2011), tinnitus (Westin, Hayes & Andersson, 2008), social anxiety (MacKenzie, 2008) and auditory hallucinations (Shawyer et al., 2007).

2.4.1.4 Experiential avoidance/ Psychological Flexibility and psychosis

Since commencement of this programme of research in 2006 there have been a collection of studies published investigating the relationship of EA with psychotic symptoms and anomalous experiences.

Several studies have explored the association between experiential avoidance and delusional ideation. Oliver, McLachlan, Jose and Peters (2011) investigated the associations between delusional ideation, mindfulness and negative schemas in a sample of 700 university students. It was found that a mindfulness measure of non-judgemental acceptance (a component of Psychological Flexibility), was demonstrated to have significant direct effects on all dimensions of delusional ideation, moreover, the effect of negative schemas on delusional distress was mediated by non-judgemental acceptance. In a similar cross-sectional study with an internet-recruited community sample Fliss (unpublished thesis, 2010) found that the relationship between delusional ideation and quality of life was statistically mediated by EA; a similar mediation was found between social functioning and delusional ideation. In a comparison EA appeared to be a stronger mediator between delusional ideation and quality life or social functioning than thought suppression.

Goldstone, Farhall, and Ong (2011a) investigating non-clinical and psychosis samples using a cross-sectional design, reported a mediating role for EA in the relationship between life hassles and delusional ideation/ delusions across both groups. This suggests that people who cope with a psychologically inflexible stance tend to experience more frequent and distressing delusional ideas, regardless of whether they have been diagnosed with a psychotic disorder (Goldstone, Farhall & Ong, 2011a). A further study with these samples (Goldstone, Farhall & Ong, 2011b), exploring vulnerabilities to psychosis and pathways to delusions, found that EA partially mediated the association between the combination of childhood trauma plus life stresses with delusional ideation/ delusions. In addition it was found that genetic heritability combined with EA contributed to delusional predisposition (Goldstone, Farhall & Ong, 2011b).

Experiential avoidance has additionally shown moderator effects with delusional ideation, negative schemas and anxiety. A longitudinal study by Oliver, O'Connor, Jose, McLachlan and Peters (2012) found that the effect of negative schemas on delusional ideation was mediated by anxiety; in addition it was found that EA/psycholological flexibility moderated the associations between schemas, anxiety and delusional ideation, suggesting that people who cope in an avoidant, inflexible way are at increased risk of delusional thinking in the presence of negative schemas and anxiety. This result can be seen as similar to the conclusions by Kashdan et al., 2006 about problems with anxiety, in that EA appears to amplify the effects of negative experiences.

EA has also been investigated with hallucinations and paranoia. Valiente et al. (2011) investigated the role of EA in the association between insight and self-acceptance for people with schizophrenia presenting with paranoia. Valiente et al. (2011) report that EA acted as a moderator in this relationship: low insight was associated with greater self-acceptance directly, while when EA was high, higher insight was associated with less self-acceptance. Goldstone, Farhall and Ong (2011c) report that for a sample of people with psychosis that hallucination persistence was predicted by pathway of life hassles, early sexual trauma and EA. Varese et al. (2011) used the experience sampling method to examine the relationship between paranoia, hallucinations, dissociation and EA in a sample of people diagnosed with schizophrenia and healthy controls. The study found that hallucinations were significantly predicted by dissociation and EA, however after controlling for comorbid paranoia only dissociation remained significant.

Udachina et al. (2009) explored the relationships between EA, paranoia and self-esteem in a student sample, using structural equation modelling and the experience sampling method with a sub-sample of participants who scored high or low on paranoia. Udachina et al. (2009) report a direct association between EA and paranoia, and that the interaction of EA and stress predicted negative self-esteem. It was concluded that EA as a stance of coping with negative self-content comes at significant cost, involving greater risk of paranoid thinking and lowering self-esteem.

Finally the relationship between EA and general distress/ well-being has been explored in people recovering from psychosis. White, Gumley et al. (2012) examined the associations between psychological flexibility, mindfulness, and depression and anxiety following psychosis: it was found that psychological flexibility and mindfulness were significantly negatively correlated with

depression and anxiety, however in regression analyses psychological flexibility alone was found to be a significant predictor of distress. In an early psychosis sample O'Donoghue, Evangeli and Morris (submitted) investigated the relationship between negative automatic thoughts, global distress, mindfulness and psychological flexibility; it was found that EA and mindfulness fully mediated the relationships between automatic thoughts and global distress for young people recovering from psychosis.

Thus, from this small literature there are indications that for both non-clinical and clinical populations that experiential avoidance may play a possible role in potentiating unusual experiences (or reducing resilience to these experiences through inflexible coping), with associated negative effects on wellbeing (similar to the research in anxiety by Kashdan et al. (2006) showing that EA appears to amplify the effects of negative experiences).

2.4.2 Cognitive Fusion

Cognitive fusion is a process by which verbal events exert strong stimulus control over responding, to the exclusion of other contextual variables/ sources of behavioural regulation (Hayes, Strosahl & Wilson, 1999; Hayes, Strosahl & Wilson, 2012, p. 69). Cognitive fusion makes it hard for humans to distinguish between a verbally-conceptualised and evaluated world and one that is directly experienced (Strosahl, Hayes, Wilson & Gifford, 2004). This can mean that action based on these products may be relatively immune to natural contingencies (Hayes, 1989): that is, direct experience plays less of a role in influencing behaviour.

It can be tremendously adaptive for humans to be influenced more by verbal networks than by directly-experienced environmental consequences (Bach & Moran, 2008): this allows for experiences to be shared symbolically (e.g., "don't touch that, it will burn you"), and for long-term and abstract goals to be achieved despite experiencing it as aversive (e.g., completing a PhD). It can be unhelpful in some contexts however, as the products of cognitive fusion are typically experienced as being synonymous with reality, without recognition that they are the result of evaluative language processes. This can lead to narrow and unhelpful behavioural repertoires, diminished contact with what situations may afford, and block taking effective action in the

service of valued ends (Blackledge, 2007; Eifert & Forsyth, 2005; Luoma, Hayes & Walser, 2007; Valvidia-Salas, Sheppard & Forsyth, 2010).

There are several forms of cognitive fusion that are targeted in the Psychological Flexibility Model: (1) fusion between evaluations and the events they are tied to, (2) fusion with the imagined toxicity of painful events, and (3) fusion with arbitrary causal relationships that form the client's "explanation", and (4) fusion with a conceptualised past or future (Strosahl et al, 2004).

It has been argued by Hayes et al. (1999) that the functional contexts that support cognitive fusion and experiential avoidance are ubiquitous (due to framing relationally being a generalised operant: see discussion above in Section 2.3.2). In RFT terms fusion involves contexts that enhance the transformation of stimulus functions for language and cognition (Blackledge, 2007). These functional contexts are also maintained by the verbal community, through normative social demands. The contexts that support cognitive fusion are those of *literality* (where symbols are treated similarly to the things they refer to), *reason-giving* (where behaviour is based upon constructed "causes", and particularly when these causes are non-manipulable, such as conditioned private events; e.g., Addis & Jacobsen, 1996), and *experiential control*, where the control of emotional and cognitive states becomes the primary goal and measure of successful living (Hayes et al., 2006). Thus, normative social demands can maintain unhelpful cognitive control and avoidance, by reinforcing people trying to understand and explain psychological events when this is unnecessary (Hayes, 2002), providing socially-valid but unhelpful explanations for actions (reasoning giving, e.g., "I couldn't go out because I was depressed), or folk psychology about the "right" sorts of thinking and emotions (e.g., stigma about anomalous experiences or unusual beliefs).

2.4.2.1 Defusion - disrupting and reducing verbal transformation of stimulus functions

Defusion is "the process of relating to thoughts just as thoughts so as to reduce their automatic impact" (Hayes et al., 2011). It is a term used to describe the inverse process to cognitive fusion (Hayes, Stosahl & Wilson, 1999), where direct experience and derived relating (i.e. appraisals) are "fused" together.

A further RFT conceptualisation of defusion by Wilson and Murrell (2004) suggests that "interventions that attenuate the relationally conditioned functions of thoughts can be considered defusion strategies… cognitive defusion… refers to procedures that broaden [behavioural] repertoires with respect to stimuli that have their psychological functions through relational (or verbal) learning processes" (Wilson & Murrell, 2004; p.131).

Therefore defusion involves expanding attention to thinking and experiencing as an ongoing behavioural process, rather than a causal, ontological result (Hayes, Strosahl & Wilson, 1999). In RFT terms defusion methods reduce the transformation of stimulus functions by altering the cues and contexts that support fusion (Blackedge, 2007; Hayes, Strosahl & Wilson, 2012). This involves teaching mindfulness, undermining sense-making, and exploring the limits of the usefulness of evaluations, and using language conventions within therapy that highlight the process of thinking (described further in Chapter 3, on Acceptance & Commitment Therapy).

2.4.2.2 Evidence for cognitive fusion as a process

The early work that led to RFT was based on clarifying the effects of rule governance (Hayes, 1989 for a review). Rule governed behaviour could be distinguished from that which was contingency shaped (Skinner, 1969), and a noticeable effect was the relative insensitivity to contingencies of reinforcement that followed the introduction of a verbal rule (Galizio, 1979; Hayes, Brownstein, Haas, Greenaway, 1986; Hayes, Brownstein, Zettle, Rosenfarb & Korn, 1986). RFT provides a means of better specifying the effects of verbal rules (Barnes-Holmes, Healy & Hayes, 2000; Hayes, Barnes-Holmes & Roche, 2001), particularly describing the properties of mutual and combinatorial entailment, and transformation of stimulus functions (see section on RFT above). Cognitive fusion, therefore, is a description of contexts where rule governance is influencing behaviour.

There is an emerging literature supportive of the contention that cognitive fusion/defusion processes are important in understanding and influencing a number of clinical problems, such as chronic pain (Johnston et al., 2010; McCracken & Vowles, 2006; Wiksell et al., 2008), depression (Zettle & Hayes, 1986; Zettle & Rains, 1989), eating disorders (Hayes & Pankey, 2002), substance abuse (Twohig, Schoenberger & Hayes, 2007), OCD (Twohig, Hayes, & Masuda, 2006; Twohig et

al., 2010) and tinnitus distress (Hesser, Westin, Hayes, & Andersson, 2009). Similarly these processes are implicated with unhelpful behaviours in healthy populations (e.g., Healy et al., 2008; Hinton & Gaynor, 2010; Masuda et al., 2004; Masuda, Feinstein, Wendell, & Sheehan, 2010; Takahashi, Muto, Tada & Sugiyama, 2002;).

Studies of psychological treatments that aim to modify the effects of cognitive fusion have typically used believability as a proxy variable for cognitive fusion (Bach & Hayes, 2002; Zettle & Hayes, 1986;). This is usually measured by asking the participant to rate the extent to which one believes the content of a thought describes reality (e.g., Bach, Hayes & Gallop, 2011; Masuda et al., 2004;). For example, in the Bach & Hayes (2002) trial for psychosis participants were asked to rate "On a scale of zero to 100, to what degree do you believe that it is true [i.e. gang members are stalking you; the voices are telling you that you are a bad person]?". A similar scale was also used as an outcome and a process measure in Gaudiano and Herbert's (2006) clinical trial for psychosis, where it differentiated between groups and mediated change (Gaudiano, Herbert, & Hayes, 2010).

It can be noted that the wording of the believability question is almost identical to 'conviction' items in measures such as the Psychotic Symptom Rating Scales (Haddock et al. 1999) and Peters Delusions Inventory (Peters, Joseph & Garety, 1999). We have argued elsewhere (Farhall, Shawyer, Thomas & Morris, in press) that believability is, in essence, a similar variable to conviction, measured within a number of studies of cognitive therapy for psychosis (e.g., Chadwick & Lowe, 1994; Garety et al., 2008). Rating believability/conviction of a thought that is, in fact, not literally true makes sense as an indicator of defusion, however, such a measure cannot pick up defusion from thoughts that are true such as "I'm going to die".

Measures of change processes in several treatment studies (depression and psychosis) have shown rapid reductions in believability of negative thoughts and unacceptability of negative feelings, even if these thoughts and feelings continue at some frequency (Bach & Hayes, 2002; Zettle & Hayes, 1986). Zettle and Hayes (1986) compared cognitive therapy (CT) and ACT in the treatment of depression, demonstrating there were differential change processes, even though there were equivalent outcomes. Process measurement suggested that ACT was associated with rapid reductions of thought believability early in therapy, while CT involved initial reductions in

thought frequency and slower rates of believability reduction (Zettle & Hayes, 1986). It has been argued that these results are suggestive of metacognitive processes and targeting of experiential avoidance, as fits with the ACT model (Pankey & Hayes, 2003). A further study by Zettle and Rains (1989) comparing ACT, cognitive therapy without decentring, and full cognitive therapy for depression, found equivalent reductions in depression at 12 weeks and 2 month follow-up, however there were differences in process, with significant positive differences in levels of dysfunctional attitudes for both forms of cognitive therapy, compared to ACT. Zettle, Rains & Hayes (2011) further analysed the data from this study, finding that compared to CT, ACT was shown to produce greater reductions in levels of self-reported depression using an intent-to-treat analysis, with post-treatment levels of cognitive defusion mediating this effect at follow-up. In contrast the occurrence of depressogenic thoughts and level of dysfunctional attitudes did not function as mediators (Zettle, Rains & Hayes, 2011).

Gaudiano & Herbert (2006) report on a mediational analysis which showed that within an ACT intervention reductions in the believability of auditory hallucinations were related to fewer rehospitalisations for a sample of patients with psychosis. Further mediational analyses on this sample (Guadiano, Herbert & Hayes, 2010) , and then combined with the Bach & Hayes (2002) sample, suggest that reduction of rehospitalisation at the 4-month follow-up, was mediated by symptom believability but not symptom-related distress (Bach, Gaudiano, Hayes & Herbert, 2012).

Experimental studies of defusion have also shown that such techniques appear to reduce the believability of thoughts as well as distress (Healy, Barnes-Holmes, Barnes-Holmes, Keogh, Luciano & Wilson, 2008; Masuda, Hayes, Sackett & Twohig , 2004; Masuda et al., 2009). For example, Masuda et al. (2004) demonstrated in a series of time-series designs and a group study that a defusion technique involving rapid verbal repetition rapidly reduces distress and believability of negative self-referential thoughts.

Until recently there has not been a formal measure of cognitive fusion: Dempster, Gillanders, Bolderston & Bond (submitted) have developed the Cognitive Fusion Questionnaire (CFQ), a 13-item self-report questionnaire. An initial validation by Dempster and Gillanders (2009) suggests that CFQ is associated in the expected directions with beliefs about worry, mindful responding to unpleasant thoughts and images, experiential avoidance, and life satisfaction. A cognitive fusion

measure for anxiety, the Believability of Anxious Feelings and Thoughts Questionnaire is also being developed (Herzberg, Sheppard, Forsyth, Credé, Earleywine & Eifert, 2012).

2.5 Summary

Psychological Flexibility is a general model of psychological functioning and intervention, based upon functional contextualism and a behavioural theory of language and cognition. There is increasing empirical support that at least two processes specified by the model, experiential avoidance and cognitive fusion, have an influential role in a number of psychological problems and social challenges. Further, there is evidence to suggest that these processes are implicated in the impact of the experience of auditory hallucinations.

Chapter 3

Acceptance & Commitment Therapy and mindfulness-based interventions

This chapter will describe a clinical intervention based upon the Psychological Flexibility Model and the current research on its use with the problems of psychosis, including distress and disability related to hearing voices.

In addition Mindfulness as a clinical intervention and construct will be discussed, and situated within a contextual behavioural framework. Outcomes and processes for ACT and Mindfulness interventions for psychosis will be outlined.

3.1 Acceptance and Commitment Therapy

The intervention that is specified by the Psychological Flexibility Model is Acceptance and Commitment Therapy (ACT), a contextual cognitive behavioural therapy that uses acceptance and mindfulness processes, and commitment and behaviour change processes, to produce greater psychological flexibility (Hayes, Strosahl, Bunting, Twohig & Wilson, 2004). The ultimate goal of ACT is to "bring verbal cognitive processes under better contextual control and have the client spend more time in contact with the positive consequences of his or her actions immediately in the present as part of a valued life path" (Hayes, Strosahl & Wilson, 2012, p. 65).

Compared to other cognitive behavioural therapies ACT emphasises changing the way people *relate* to their thinking and feeling, rather than directly trying to change the form or frequency of these experiences. This has been suggested to be a key feature of the "third wave" in the development of behaviour therapies (Hayes, 2004).

3.1.1 "Third Wave", contextual approaches to CBT

In considering the history of behaviour therapy, Hayes (2004) put forward the contention that the development of CBT can be considered as having three waves of development, with each wave representing a change in paradigm. Hayes (2004) described that the first wave was characterised

by the behaviour therapy of the 1950's and 1960s, which focused on direct behaviour change (e.g., Wolpe & Lazarus,1966), and although successful in a number of domains, did not have adequate methods for addressing client problems that appeared influenced by cognition (such as reason-giving, unhelpful rule-following). Influenced by the cognitive revolution in psychology (e.g., Chomsky, 1959), the second wave of CBT saw the introduction of methods directly focused on changing the form and frequency of cognition linked to clinical disorders (e.g, Beck, 1970; Meichenbaum & Cameron, 1974), while also incorporating the exposure- and skills-based techniques from traditional behaviour therapy. Hayes (2004) argues that these approaches to cognition also represented a move away from operant and classical conditioning accounts of human behaviour, to that of information processing. However it has been argued that while models of clinical disorders based on information processing were developed, these models were not based strongly upon basic accounts in cognitive psychology (Teasdale, 1993; Strauman & Merrill, 2004), but instead were clinical cognitive models (e.g., Beck, 1993;). This has raised some contention, with suggestions that possibly cognitive restructuring techniques based upon the rationales of these models may not be active components in CBT (e.g., Longmore and Worrell, 2007; Jacobson et al., 1996).

Hayes (2004) argues that mindfulness-based CBT approaches belong to a complimentary grouping of therapies, which have an emphasis on *second-order change*, that is, process- rather than content-focused change as a putative change process. Hayes (2004) described this grouping as a "third wave" of behaviour therapies as representing a shift in emphasis to the target of therapy being on the problematic processes of thinking, rather than the content (a contextual focus). Thus, with this categorising, any cognitive-behavioural approach that focuses upon process change can be considered a third-wave/ contextual CBT. Within this grouping therefore are approaches that at the level of philosophy and theory are dissimilar, with the major differences between sets of approaches upon whether they are based upon a functional contextualist or mechanist philosophy, and, subsequently, whether they subscribe to a relational operant (described in the Relational Frame Theory section) or an information processing model of human behaviour.

3.1.2 Historical development of ACT

As described in section 2.3 above, ACT has emerged from the basic research on rule governance and relational frame theory: based on these findings it was hypothesised that many psychological problems are (at least in part) the result of following unhelpful rules to receive social approval (pliance), or inaccurate rules about how private experiences work (tracking). It was suggested that more effective behaviour could be developed through contingency-shaped procedures (i.e., learning from experience; Hayes, Strosahl & Wilson, 1999), however because psychological therapy can be largely a verbal enterprise, there were risks that unhelpful rule governance could be reinforced (e.g., doing exposure to please the therapist; strengthening the unhelpful link between the "right" types of thinking and personal goals) (Morris & Oliver, 2012). In addition verbal behaviour seemed to play a role in amplifying distress and dysfunction (see Sections 2.4.1 and 2.4.2 above on cognitive fusion and experiential avoidance), with clients describing problems with private experiences, particularly in efforts to control and eliminate them, as well as engaging in reason-giving, so that it became a barrier to engaging in effective behavioural methods such as exposure (Hayes, 1989). These observations suggest that it is not the presence of particular cognitions that was dysfunctional, instead it was the *function* of these experiences.

The prototype treatment that became ACT was called "Comprehensive Distancing" (Zettle & Hayes, 1986), which was designed to alter the functions of negative thoughts through elaborated and extended forms of cognitive distancing. "Cognitive distancing" was suggested by Hollon & Beck (1979, p.179) as the "first, critical step" in cognitive therapy to helping the client detect their thoughts and see them as hypotheses rather than facts (which then subsequently would be altered through cognitive restructuring). The difference was that in Comprehensive Distancing cognitive restructuring was not a component of treatment, rather clients were encouraged to engage in mindfulness and defusion exercises, as well as behaviour components such as goal-setting. (The results of the Comprehensive Distancing studies by Zettle & Hayes (1986) and Zettle & Rains (1989) are described in Section 2.4.2.2 above). As the basic work that formed RFT proceeded (e.g., Hayes, 1984) Comprehensive Distancing was modified to include components on self as context and values (Zettle, 2005), and was renamed Acceptance and Commitment Therapy in 1994 (Hayes & Wilson, 1994).

3.1.2 Treatment approach

ACT is designed to help clients use psychological acceptance as a strategy in situations where internal or external sources of distress cannot be easily changed. In ACT the client is encouraged to accept unavoidable private events through developing mindfulness of the process of cognition, and learn to identify and focus on actions directed toward valued goals. The aim in ACT is to help clients become less entangled with their symptoms and more focused on effective behaviour (Hayes, Strosahl & Wilson, 1999), with the goals to treat emotional avoidance, excessive literal response to cognitive content, and inability to make and keep commitments to behaviour change (Hayes & Wilson, 1994).

ACT does this through the use of acceptance strategies and encourages the client's commitment to valued life directions and choices. The use of acceptance involves a disavowal of strategies aimed at controlling emotional experience, an allowance of feelings and their processing, and an end to experiential avoidance as a habitual mode of coping (Segal, Williams & Teasdale, 2002). Through this mindful action the individual is able to step back from distressing internal experiences, gain perspective and permit feelings to emerge that provide direction for action, thus breaking the maladaptive use of control.

The ACT approach encourages the client to view internal experiences (such as thoughts, images and feelings) as "events in the mind" rather than literal content, and helps the client to develop a mindfulness regarding these experiences. The model for ACT argues the case for using this form of intervention when clients are struggling with internal events that are not amenable to control, and when persisting with the unhelpful change agenda leads to problems in everyday living. An aspect of this is to undermine literal sense-making where it is not useful, helping the client to notice contexts where "making sense" of experiences leads to paradoxical outcomes. Thus "making sense" may be function as an unhelpful form of control that serves to maintain difficulties. The ACT model facilitates a change in agenda from controlling internal events that may not be able to be avoided to focusing upon behaviour change that can lead to positive outcomes.

ACT was developed to foster experiential learning, helping the client to contact the effects of their choices and actions, and to discriminate these effects from how their thoughts say it should be

(Morris & Oliver, 2012). There is a concordance between the functional contextualist philosophy and ACT in practice in terms of an a-priori value or goal: the client is encouraged to consider the workability of their actions from the perspective of whether this helps them make progress in valued directions (Hayes, Strosahl & Wilson, 1999, 2012). This results in ACT emphasising different outcomes than many mainstream psychological therapies, with a primary focus on quality of life, functioning and meaning, rather than symptom elimination (Ciarrochi & Bailey, 2008; Morris & Oliver, 2012).

Case formulation in ACT is dimensional and functional (Bach & Moran, 2008). The formulation focuses on how particular behaviour repertoires are interfering with valued life goals, and how the client can develop a more psychologically flexible approach to what life offers. Functional analysis, rather than diagnosis, is used to understand the client's problems, considering the functional relationships between the client's behaviour and the environmental variables that support problems or influence clinical improvements (Bach & Moran, 2008). The formulation informs which skills are emphasised from the Psychological Flexibility Model (Figure 2.2 and Table 2.2): some clients will require the development of several skills, while for others it may be one or two areas. Due to the ACT processes being inter-related, progress in one domain will facilitate the strengthening of the others (e.g., values work may contact flexible attention to the present moment, acceptance and defusion, as the client takes actions that evoke previously-avoided feelings).

3.1.3 Outcome Studies

Following the publication of the Hayes, Strosahl & Wilson (1999) treatment manual there was skepticism regarding the empirical status of ACT (e.g., Corrigan, 2001), and criticism from cognitive therapy advocates regarding whether the model did work by differing processes compared to mainstream CBT (Hofmann, 2008; Hofmann & Asmundsson, 2008).

At the time of writing there have been 62 randomised controlled trials of ACT, across a wide range of disorders and problems: for example, depression (Zettle & Hayes, 1986), work stress (Bond & Bunce, 2000), substance abuse (Hayes et al., 2004), chronic pain (Dahl, Wilson & Nilsson, 2004;

Vowles & McCracken, 2008), borderline personality disorder (Gratz & Gunderson, 2006), treatment refractory epilepsy (Lundgren, Dahl, Melin & Kies, 2006),generalised anxiety disorder (Roemer, Orsillo & Salters-Pedneault, 2008), amongst other problems (the randomised controlled trials for psychosis will be discussed below, in Section 3.2.2).

Several meta-analyses and systematic reviews have been conducted regarding ACT outcome studies (Hayes et al., 2006; Ost, 2008; Powers, Zum Vorde Sive Vording & Emmelkamp, 2009; Ruiz, 2010).

Hayes et al. (2006) reviewed the outcome studies published until 2005 comparing ACT to treatment as usual, placebo and waiting list, producing large weighted average effect sizes. Hayes et al (2006) reported that in studies that directly compared ACT to CBT preliminary between-condition effect sizes appeared to favour ACT; this was based upon a modest combined sample, and with ACT studies that lacked methodological rigour, with the increased chance of effect sizes being inflated. Ost (2008) subsequently compared ACT studies with a matched set of CBT trials, criticising the methodological weaknesses of ACT trials, concluding that ACT was not an evidence-based treatment. Gaudiano (2009) responded to these criticisms, arguing that matching ACT and CBT studies was a flawed comparison, as a substantial number of the ACT studies were not matched because there was not an equivalent CBT study, in addition these ACT studies were with more severe problems in hard to treat populations (e.g., chronic medical conditions, psychosis, borderline personality disorder, compared to the CBT studies: 2 trials for depression and 11 for anxiety). In addition Gaudiano (2009) demonstrated that there were significant differences in funding favouring CBT trials (so that these trials were more methodologically sound, due to having significantly more resources).

Powers et al. (2009) produced a meta-analysis combining the ACT trials that had compared ACT with waiting lists, psychological placebos, treatment as usual, and established therapies. The authors concluded that ACT demonstrated efficacy over control conditions, and was superior to waiting lists, psychological placebos and treatment as usual. Compared to established treatments (cognitive therapy and interpersonal therapy), Powers et al (2009) found that ACT did not demonstrate any distinct advantage, however they suggested that this was not a weakness due to the frequent finding of psychotherapy equivalences in outcomes. Ruiz (2010) reviewed the range

of outcome studies across clinical psychology, health interventions, and areas such as work and sport performance, and the reduction of stigma and prejudice. Ruiz (2010) concluded that ACT shows efficacy across disorders where experiential avoidance is present, in the context of cognitive fusion; that comparisons with CBT are in early days, with ACT showing promise as being equivalent to CBT in some disorders and in some cases potentially more efficacious; and that studies suggest that ACT does appear to work through the processes suggested by the Psychological Flexibility Model (reducing experiential avoidance and cognitive fusion).

Based upon these reviews it can be asserted that ACT is showing increasing empirical support in treatment efficacy across a range of clinical disorders and problems. Studies show that ACT performs better than no-treatment and active controls, and indicate equivalent outcomes to established empirically-based treatments (usually cognitive therapy or CBT) for several disorders. However, the early ACT randomised controlled trials were less methodologically rigorous, possibly due to comparatively less funding; recent studies have been more rigorous (e.g., Arch, Eifert, Davies, Vilardaga, Plumb; Rose & Craske, 2012; Forman, Shaw, Goetter, Herbert, Park & Yuen, 2012).

3.1.4 ACT Mediation and process of change studies

The Psychological Flexibility Model specifies the processes of change that are hypothesised to occur in ACT and other contextual behaviour therapies (see section 2.4). A number of ACT treatment studies have investigated the mediation of outcomes through changes in psychological flexibility (see Section 2.4.2.2 for a discussion of the mediation analyses by Zettle, Rains & Hayes, 2010, and Gaudiano & Herbert, 2006).

These mediation analyses have been conducted using the steps described by either Baron & Kenny (1986) or McKinnon et al. (2002). Hayes et al. (2006) and Hayes, Levin et al. (2012) report that analyses have suggested that changes in psychological flexibility mediate outcomes for ACT interventions (but not comparison interventions) in: workplace stress (Bond & Bunce, 2000), diabetes management (Gregg, 2004), smoking cessation (Gifford et al., 2004), counsellor burnout and stigmatising attitudes (Hayes, Bissett et al., 2004), distress in end stage cancer (Bransetter et

al., 2004), treatment-refractory epilepsy (Lundgren, Dahl, Melin & Kies, 2005; Lundgren et al., 2008), outcomes from trainee therapists (Lappalainen et al., 2007), and distress in obesity (Lillis, Hayes, Bunting & Masuda, 2009). These mediational studies are variable in quality, with some of the studies demonstrating mediation using processes assessed before outcome differences are shown, while in other studies the mediators were assessed concurrently with outcome (Hayes et al., 2011).

There are a number of ACT studies that have reported changes on processes variables consistent with the Psychological Flexibility Model: for example, McCracken, Vowles and Eccleston (2007) found that changes in acceptance of pain during treatment were associated with change in a number of outcome variables, including depression, pain-related anxiety, physical and psychosocial disability. Similarly process changes associated with outcome have been reported in ACT studies for trichotillomania (Woods et al., 2006), social phobia (Block & Wulfert, 2000), and OCD (Twohig, Hayes & Masuda, 2006).

Based upon the criticisms of ACT being proposed to work by different processes of change than cognitive therapy (e.g., Hofmann & Asmundsson, 2008), Ruiz (2012) conducted a systematic review and meta-analysis of the 16 studies that have compared ACT versus CBT for outcomes and processes of change. Ruiz (2012) found that mean effect sizes for primary outcomes favoured ACT, specifically for depression and quality of life outcomes. In addition ACT showed a greater impact on its processes of change and no differences were found with CBT proposed processes; this was from nine studies that conducted formal mediation analyses. Ruiz (2012) concludes that, based on these comparisons, there is support for ACT working through the processes of change identified by the Psychological Flexibility Model, while CBT has not yet shown similar results for the processes of change suggested by the cognitive model.

3.2 ACT for Psychosis

3.2.1 The rationale for an acceptance-based intervention in working with psychosis

In addition to the advantages described above for promoting Psychological Flexibility in terms of well-being, broadening narrow behavioural repertoires that are unhelpful (avoidance), and promoting quality of life and values-based living, there may be particular benefits related to the problems of psychosis.

Relational Frame Theory suggests that there may be a risk of iatrogenic effects for interventions that focus on the modification of private events (Hayes, Barnes-Holmes & Roche, 2001). It may be possible that some therapeutic efforts to modify thoughts in psychosis may inadvertently maintain or accentuate unhelpful processes that are contributing to disability (Bach, 2004), through functionally encouraging thought suppression, excessive focus on cognition, and beliefs about the necessity of "fixing thinking" before effective action can be taken.

People with schizophrenia tend to talk more about disordered thinking, and make more references to their own cognitions compared to normal controls (Rosenberg & Tucker, 1979), which may be suggestive of greater cognitive fusion and excessive inward focus with psychotic symptoms. Morrison (2001) has suggested that selective attention and heightened self-focus in psychosis may increase the actual frequency or perceived frequency of intrusions into awareness, so that safety behaviours and attempts at control are implicated in the maintenance of distress. It has been found that hallucinators have stronger beliefs about the abnormality of intrusive or unwanted thoughts, greater desire for consistency in cognition, and less confidence in their cognitive processes (Lobban, Haddock, Kinderman & Wells, 2002). In addition (as discussed in Chapter 1) attempts at thought suppression can result in paradoxical rebound effects (Wegner, 1994). Excessive focus on cognition appears to come at a price: Bargh & Chartrand (1999) discuss evidence that suggests that when a person tries to control private events in one domain of behaviour, it becomes more difficult to exert conscious control over simultaneously occurring behaviours.

An ACT approach to psychosis aims to avoid these potential pitfalls by focusing on the functional *relationship* between cognition and overt behaviour (e.g., Péréz-Alvérez et al., 2008). This is based on a functional contextualist view that thoughts/beliefs do not cause behaviour, rather it is contextual features that link, for example, an appraisal to behaviour, such as support for the literal meaning of the thought, or the need to avoid certain thoughts. The ACT approach aims to help

clients *notice* the process of appraisal while maintaining flexibility with regard to action. The target in this approach is altering the relationship of behaviour and positive symptoms, rather than trying to change symptom frequency, challenging the veracity of delusions, or altering the thinking errors or biases associated with the symptoms. ACT focuses on altering the believability and behavioural impact of problematic cognitions without directly challenging them or targeting their content for change (Bach & Hayes, 2002). What is important is the functional relationship between an appraisal and overt behaviour. The rationale for the ACT approach to psychosis is that real difference in patients' lives and their level of functioning comes from behaviour rather than the presence of symptoms (Bach, 2004). Making changes in behaviour, however, frequently involves changes in psychological flexibility.

ACT suggests willingness and defusion as the means that clients learn that acceptance of aversive private emotion or bodily state is a process rather than an outcome (Pankey & Hayes, 2003). ACT shifts the focus from modifying private experience to modifying the behavioural reaction to the private experience. Acceptance of private experience involves learning that literal truth or falsity of cognition need not be a target for change, rather it may be more effective to focus the efforts of change on goals and behaviours (Pankey & Hayes, 2003). Thus there is a focus on the *workability* of the individual's behaviour, with greater flexibility and expansion of response being more important than the nature of the new response functions (Hayes & Pankey, 2003). For example, a person who typically responds to hearing voices by social isolation and arguing with the voices may through acceptance work develop a broader repertoire of behavioural responses to voice hearing. These might include activities such as going out of the house, having a conversation with another person, deliberately appreciating the acoustic properties of the voices, or engaging in a valued activity as well as the responses that were developed to control the voices. The clinical focus would be to add new functions to the experience of hearing voices so that there is a chance for alternative contingencies to operate, rather than just the previously dominant aversive and avoidant functions (I.e., transformation of stimulus functions: see section 2.3).

3.2.2 Outcome Studies

There is emerging evidence to suggest that the contextual approach to psychosis using acceptance and mindfulness may help to reduce the impact of psychotic symptoms, particularly in terms of believability and disruption to functioning.

There have been a small number of studies investigating the efficacy of ACT in the treatment of psychosis showing promising results (Bach & Hayes, 2002; Guidiano & Herbert, 2006; White, Gumley McTaggart, Rattrie, McConville, Cleare & Mitchell, 2011). Protocols have been developed for the use of ACT with psychosis, in brief (<6 sessions in RCTs: Bach & Hayes, 2002; Gaudiano & Herbert, 2006) and longer forms (10 sessions: White et al., 2011). There have also been studies published that have used ACT components, within a broader CBTp framework (Hepworth, Startup and Freeman, 2011; Shawyer et al., 2011;). There have a number of case studies published using ACT with various problems in psychosis (e.g., Bach, Gaudiano, Pankey, Herbert & Hayes, 2006; Bloy, Morris & Oliver, 2011; Garcia & Perez, 2001; Pankey & Hayes, 2003; Thomas, Morris, Shawyer & Farhall, in press; Valmaggia & Morris, 2010; Veiga-Martinez, Perez-Alvarez and Garcia-Montes, 2008;).

Bach and Hayes (2002), in a study with participants who have been hospitalized with psychosis, found that ACT had short-term benefits in reducing subsequent re-hospitalization within a follow-up period of 4 months. The participants in this study were recruited from an inpatient unit and following an individual four-session intervention, participants that were in the ACT condition were half as likely to be hospitalized compared to treatment as usual (TAU) control participants at four month follow-up. There was an outcome difference between participants primarily reporting delusions and those primarily reporting hallucinations, with the intervention having little impact on the re-hospitalization rate of participants with delusions and a large treatment effect for auditory hallucinations. For those reporting symptoms at the follow-up period, ACT participants showed greater reductions in the believability of symptom content. Bach, Hayes and Gallop (2012) reported on an extension of the follow-up for this trial to 1 year by consulting health records in the hospital system of Nevada. It was found that those in the ACT condition showed a significant reduction in re-hospitalisation at 1 year; survival analyses demonstrated effects favouring ACT at 1 year, when length of prior and the current hospitalisation were taken into account.

Gaudiano & Herbert (2006) conducted randomised controlled trial to replicate and extend the previous findings by Bach and Hayes (2002). The participants were inpatients with psychotic symptoms who were randomly assigned to enhanced TAU or enhanced TAU plus individual sessions of ACT (mean number of sessions = 3). The results showed greater improvements in the ACT group at post-treatment on affective symptoms and global improvement, and self-rated distress associated with hallucinations and impairment in social functioning. Large effect size improvements were demonstrated in both groups pre- to post-treatment, with medium effect size differences between groups favouring the ACT condition. In addition, significantly more participants in the ACT condition reached clinically significant improvements in overall symptoms at post-treatment. At 4-month follow-up, 45% of participants in the ETAU only group had been re-hospitalised compared to 28% of those in the ACT group.

White, Gumley et al. (2011) conducted a blind-rated feasibility trial of ACT for emotional dysfunction following an episode of psychosis. The participants in this study were people recovering from a recent episode of psychosis and experiencing depression and/or anxiety. A 10 session ACT intervention plus TAU (community psychiatric care), was compared with TAU alone. White et al (2011) found that those receiving ACT showed a significant reduction in negative symptoms and a greater increase in mindfulness skills; those in the ACT condition also has significantly fewer crisis contacts over the course of the study (although potentially due to increased therapeutic contact). Changes in mindfulness skills were associated with changes in depressive symptoms. Significant differences between conditions were not found on measures of positive symptoms, anxiety or depression, similarly there were no significant changes on a measure of psychological flexibility. However post-hoc analyses of caseness showed that a significantly greater proportion of those in the ACT condition changed from being depressed on entry to the study (established by a cut-off score) to not being depressed at 3 month follow up. This study established that ACT is an acceptable treatment for participants, and may have potential as a therapy for depression in the context of psychosis.

3.2.3 ACT components in psychological interventions for psychosis

Several studies have used ACT components as part of a broader cognitive behavioural intervention.

Hepworth, Startup and Freeman (2011) describe the pilot evaluation of a brief intervention, Emotional Processing and Metacognitive Awareness (EPMA), that was trialled on 12 patients with persisting persecutory delusions. The EPMA protocol was designed to facilitate emotional disclosure for the purpose of reducing delusional distress; the three session protocol contained ACT components of cognitive defusion and acceptance (e.g., Masuda et al., 2004; Hayes & Smith, 2005). It was found that EPMA reduced delusional distress with improvements maintained at follow-up; the authors reported that these results are likely to be an inflation of the effect of the intervention, due to the lack of a control group and blind ratings.

Shawyer et al. (2012) investigated the use of an "acceptance-enhanced" CBT (A-CBT) intervention for command hallucinations, comparing this with befriending in a randomised controlled trial. The CBT intervention had acceptance and defusion components from the Bach & Hayes (2002) ACT protocol. The study found no significant differences in the blind-rated outcome measures between the A-CBT and befriending groups (the interventions both showed improvements compared to waiting list), although the A-CBT participants reported subjectively greater improvement in command hallucinations. Shawyer et al. (2012) report within-group analyses and comparisons of combining the treatments compared to waiting list: these results suggested that both treatments produced improvements in confidence in coping with command hallucinations and reductions in life disruption from auditory hallucinations as well as the omnipotence of the voices, compared to waiting list. Shawyer et al report that there were differences between A-CBT and befriending in the pattern of treatment effects: A-CBT was associated with changes in illness severity, global functioning and quality of life, as well as process measures of acceptance of auditory hallucinations; befriending was associated with trend improvements across outcome variables, significant improvements in acceptance of command hallucinations and reductions in distress (only in this condition and at the study endpoint). While Shawyer et al (2012) report that the trial quality was objectively high one of the limitations was that, despite a wide recruitment strategy, they were not able to recruit the full number of participants with command hallucinations to have adequate power.

3.2.4 Mediation in ACT for Psychosis Outcome Studies

There have been several mediation analyses conducted on randomised controlled trials of ACT for psychosis, using the data from Gaudiano and Herbert (2006a) alone, and also combined with Bach and Hayes (2002).

Two mediation analyses have been conducted on the data from the Gaudiano and Herbert (2006a) trial. The first of these (Gaudiano & Herbert, 2006b) explored the general relationship between hallucination frequency, believability (a proxy for cognitive fusion, see the earlier discussion in Section 2.4.2 on this variable), and symptom distress, using the recommendations by Baron and Kenny (1986) to establish mediation. Gaudiano and Herbert (2006b) demonstrated that in this sample believability in hallucinations mediated the relationship between symptom frequency and distress. The authors then argue that because improvement in the believability of hallucinations over time was only observed in the ACT condition, that this may be supportive of the hypothesised processes of change for ACT. However Gaudiano and Herbert (2006b) also report that they were not able to establish mediation analyses by treatment group, due to low power; in addition conclusions regarding mediation are limited due to lack of clarity around the temporality of the variables, due to the Gaudiano and Herbert (2006a) assessment procedures.

A subsequent mediation analysis of treatment effects was reported by Gaudiano, Herbert & Hayes (2010). This analysis was conducted using the non-parametric bootstrapping procedure described by Preacher and Hayes (2004, 2008), which has several advantageous over the Baron and Kenny (1986) approach and does not require distributional assumptions, making it more appropriate for smaller samples. Gaudiano, Herbert & Hayes (2010) report that these analyses demonstrated that believability of hallucinations at post-treatment mediated the effect of treatment condition on hallucination distress. This hallucination believability appears to explain the effect of ACT on hallucination distress, relative to those participants who received treatment as usual. Again, conclusions regarding mediation in this study are limited due to the temporality issues described above.

Finally Bach, Gaudiano, Hayes and Herbert (2012) describe an analysis based upon the combined data from two ACT for psychosis trials to investigate the mediators of rehospitalisation (Bach &

Hayes, 2002 and Gaudiano & Herbert, 2006a). Samples were combined to provide greater statistical power. Bach et al (2012) investigated post-treatment scores of psychotic symptom believability, distress and frequency as mediators of rehospitalisation, while controlling for baseline scores of these measures. It was found that believability mediated differences in rehospitalisation between the ACT and treatment as usual conditions for this combined sample. The same analyses for symptom distress or frequency as mediators of rehospitalisation were not significant. Further analyses were conducted to check whether differences in the temporality of variables taken from the two studies may have influenced the results: this did not appear significant. Bach et al (2012) conclude that these results strengthens the conclusions from the Gaudiano, Herbert and Hayes (2010) study regarding a process of change in ACT for psychosis being the promotion of cognitive defusion.

3.2.5 Summary

The small number of studies exploring the efficacy of ACT for psychosis suggests that this approach may have potential in ameliorating the impact of hallucinations, negative symptoms and depression, through promoting mindfulness (White, Gumley et al., 2011) and reducing believability (e.g., Bach et al., 2012). These changes are consistent with the processes described by the Psychological Flexibility Model. Of note is that ACT studies have demonstrated mediation consistent with theorised processes of change, while CBT for psychosis studies have not been able to (yet) demonstrate mediation (e.g., Garety et al., 2008; Granholm, Ben-Zeev & Link, 2009). There is mixed evidence to suggest that the incorporation of ACT components such as defusion and active acceptance within broader CBT packages is efficacious (e.g., Hepworth, Startup and Freeman, 2011; Shawyer et al., 2012;).

3.3 Mindfulness

"Wherever you go, there you are" –J. Kabat-Zinn, 1994

Mindfulness describes a method of paying attention that, as a practise, is thousands of years old in human civilisations; mindfulness has typically been associated with Eastern contemplative spiritual

traditions such as Buddhism (Kabat-Zinn, 1982; Linehan, 1993) and has been gaining increasing interest in the West. Mindfulness is generally described as "*paying attention in a particular way: on purpose, in the present moment, and non-judgmentally*" (Kabat-Zinn, 1994, p. 4), where a person intentionally focuses their attention on the experience of the present moment in a non-judgemental and accepting way. This state of mind can be contrasted with behaving automatically and when attention is focused elsewhere, on private experiences such as memories, worries, plans or fantasies (Brown & Ryan, 2003). Segal, Teasdale and Williams (2002, 2004) describe mindfulness as a "being" mode of mind, which can be usefully contrasted with the "doing" mode, which dominates cognitive processes and may play a role in supporting unhelpful rumination and worry. Kabat-Zinn (2003) describes mindfulness as also including compassion and curiosity toward experiences that are observed in the present moment (regardless of how pleasant they are). Bishop et al. (2004) provide the following consensus definition of mindfulness: *"… a process of regulating attention in order to bring a quality of non-elaborative awareness to current experience and a quality of relating to one's experience within an orientation of curiosity, experiential openness, and acceptance...* [it is] *a process of gaining insight into the nature of one's mind and the adoption of a de-centered perspective… on thoughts and feelings so that they can be experienced in terms of their subjectivity (versus their necessary validity) and transient nature (versus their permanence)*". (p. 234)

Mindfulness has been the focus of scientific investigation as psychological therapy approach over the past 30 years, and recently with increasing interest. Mindfulness-based therapy approaches aim to increase a focused, purposeful awareness of the present moment and relating to one's experiences in an open, nonjudgemental, and accepting manner (Baer et al., 2006; Kabat-Zinn, 1994;). The pre-eminent therapy approach was Mindfulness-Based Stress Reduction (MBSR: Kabat-Zinn, 1982, 1990), which is based on an intensive training in mindfulness meditation, and developed in a behavioural medicine setting for people with chronic pain and stress-related conditions. Within the cognitive-behavioural tradition mindfulness has been a component of a number of therapy approaches, first introduced by functional analytic behaviour therapies such as with Dialectical Behaviour Therapy (DBT) for women with borderline personality disorder (Linehan, 1993) and Behavioural Activation for depression (Martell, Addis & Jacobson, 2001). Similarly mindfulness was a component of the early form of ACT, called Comprehensive Distancing, as a

treatment for depression and anxiety (Hayes & Zettle, 1986; Zettle, 2005). In cognitive therapies mindfulness as practiced within MBSR was incorporated as a component of Mindfulness-Based Cognitive Therapy (MBCT) by Segal, Williams and Teasdale (2002), as a means of helping people who experienced recurring major depression prevent further relapses.

Typically mindfulness is practiced using the following steps (Baer & Krietemeyer, 2006): 1) the participant is encouraged to focus their attention on an activity (such as breathing, walking or examining an object like a raisin) and to observe it carefully; 2) the participant is directed to notice when their attention wanders from the focus to private experiences; and when this happens, 3) to observe briefly that their mind has wandered; and 4) to return to attention to the focus of the exercise. Participants are encouraged to observe their experiences of bodily sensations, emotions and urges, to notice what it feels like to have these experiences, including where in the body they are felt, and whether these experiences are changing over time. Mindfulness may include some covert labelling of experiences, such as the participant using short words or phrases (e.g., "a thought", "irritation", "urge to move"), in order to encourage an observing perspective in the present moment (Baer & Kreitmeyer, 2006). The aim of mindfulness exercises is not to achieve a state such as relaxation, but rather to notice the process of thinking and feeling, and practice a stance of non-judgement and acceptance to the changing stream of stimuli that is experienced.

There are varied practices across therapies about how much of a focus there is upon formal meditation: in MBSR and MBCT formal meditation practice is a central activity, while in the functional analytic approaches of DBT, ACT and Behavioural Activation mindfulness meditation is encouraged, but other practices are also considered to be building the skills associated with mindfulness and may be focused upon more (e.g., ACT defusion exercises, use of compassionate imagery and perspective taking, brief "noticing" exercises).

3.3.1 How mindfulness is conceptualised: cognitive and contextual accounts

One of the challenges of research into mindfulness is that although there are agreements about how mindfulness can be used as a technique, there is not an agreed-upon definition of mindfulness in the psychology literature (Hayes, Strosahl & Wilson, 2012). Hayes and Wilson (2003) account that the various definitions of mindfulness (e.g., Bishop et al., 2004; Dimidjian and

Linehan, 2003; Kabat-Zinn, 1994) outline a psychological process, an outcome, or a collection of techniques. This is also in part the result of a folk psychology concept being incorporated into interventions without adequate specification of the processes the technique is hypothesised to influence: specification of processes also points to the assumptions of science that a treatment is developed within. Hayes, Strosahl and Wilson (2012) argue that a progression in understanding mindfulness may be helped by researchers outlining their starting assumptions - this may clarify the difference in paradigms (e.g., mindfulness interventions based upon Buddhist, functional contextualist and cognitive accounts).

This can be illustrated by the rationales, based on differing starting assumptions, between cognitive and contextualist paradigms for understanding and using mindfulness.

For example, as part of the rationale for MBCT, the practice of mindfulness is seen as an alternative cognitive mode (Teasdale, 1999), where the focus of processing is at a level of representation that is not conceptual, so that specific discrepancies are not the prime target of processing (Segal, Teasdale & Williams, 2004). This feature of mindfulness makes it incompatible with the kind of cognitive processing that has been shown to engender relapses in depression. Other cognitive researchers have described mindfulness as a way shifting attention to reduce the influence of maladaptive beliefs on on-line processing (e.g., Wells, 2002). Mindfulness therefore promotes the type of cognitive distancing described by Hollon & Beck (1979): the difference between a traditional cognitive therapy account and current theorising is that several authors have suggested that distancing may be a central process that enables cognitive therapy to achieve its effects (Ingram & Hollon, 1986; Teasdale, Segal & Williams, 1995), rather than a component that is necessary but not sufficient before more active intervention occurs by engaging in cognitive restructuring. Again, this cognitive account considers constructs such as cognitive processing and attention as mental mechanisms capable of being understood independently of the contexts in which they occur: this has implications for how mindfulness is conceptualised and what techniques are considered to be “mindfulness”.

The rationale for mindfulness within ACT focuses instead on how it may promote flexible repertoires of behaviour based upon chosen personal values. Fletcher and Hayes (2005) define mindfulness therefore as using four processes from the Psychological Flexibility Model: flexible

attention to the present moment, acceptance, defusion, and self as context. This definition is couched within the functional contextual perspective of "a whole organism acting in context, historically and situationally". Fletcher and Hayes (2005) argue that this conceptualisation of mindfulness is advantageous because (1) it links more tightly core processes of literal language and cognition (as outlined by a Relational Frame Theory account); (2) other definitions do not specify each of the four processes, in particular, in most definitions processes for promoting a transcendent sense of self (Hayes, 1984) are rarely specified/ implicit; and (3) the functional definition of mindfulness in ACT means that there is no linkage with particular methods or techniques, so that any method that changes these processes is considered relevant (Hayes & Shenk, 2004). This is in contrast with other definitions which are written in more general or folk psychology language and may implicitly suggest that what mindfulness achieves is singularly fostered by meditation (e.g., MBSR).

3.3.2 Measurement of mindfulness – trait and state

Mindfulness has typically been measured using self-report scales, as a trait or disposition (e.g., Baer, Smith & Allan, 2004), and as a state (e.g., the Toronto Mindfulness Scale, Lau et al., 2006). Other measurement approaches have explored correlates of mindfulness using neuropsychological (e.g., Holzel et al., 2007) and cognitive measures (Sauer et al., 2012), as well as qualitative interview methods (Griffiths et al., 2009; Abba, Chadwick & Stevenson, 2008).

The standard approach of self-report has attracted criticism: Grossman (2008) contends that approaches to measuring mindfulness lack a common conceptualisation of the construct, and that this is due in part to researchers being unfamiliar with the theoretical concept of mindfulness as described in Buddhist psychology. Several authors have described that mindfulness is a subtle and somewhat elusive construct and that defining it in concrete terms is difficult (Block-Lerner, Salters-Pedneault, & Tull, 2005; Brown & Ryan, 2004). Related to this, Grossman (2008) argues that self-report of mindfulness may be biased due to idiosyncratic and naive understandings of mindfulness: that the novice and experienced meditator may rate their ability to be mindful at similar levels, despite there being an actual difference between them. Sauer, Walach, Schmidt et al. (2012) point out that this criticism is not particular to the measurement of mindfulness and is

an example of the measurement problem of response shift (e.g., Oort et al., 2009), due to changing internal reference standards for participants.

Despite the contention that mindfulness should be considered a unitary construct (Brown & Ryan, 2003), there is an emerging consensus from studies measuring mindfulness by self-report that it is a multidimensional construct (Baer et al., 2004; Brown & Ryan, 2004; Brown et al., 2007; Chadwick et al., 2008). Consistent with the definition of mindfulness put forward by Bishop et al. (2004), mindfulness appears to consist of two distinct factors: 1) an attentional focus to the present moment, and 2) acceptance, ie a genuine, non-judgemental, open and accepting attitude to what is happening in the present moment. In addition to the psychometric findings supporting a two-factor conceptualisation (eg., Kohls et al., 2009), there is some experimental evidence for the validity of this concept of mindfulness (Sauer et al. 2011).

The two most frequently cited mindfulness measures are the Kentucky Inventory of Mindfulness Skills (Baer, Smith and Allen, 2004) and the Mindfulness Attention Awareness Scale (Brown & Ryan, 2003). These will be described below, as well as other major instruments that have been developed using a multidimensional conceptualisation of mindfulness.

Baer, Smith and Allen (2004) described the development of the Kentucky Inventory of Mindfulness Skills (KIMS), which aims to measure the mindfulness skills taught in MBSR, MCT, DBT and ACT. The four subscales of the KIMS are described as: Observe (attending to a variety of stimuli, both internal, such as bodily sensations, cognitions and emotions, as well as external, sounds and smells), Describe (describing or labelling phenomena by covertly applying words), Acting with Awareness (engaging fully in current activity with undivided attention), and Acceptance without Judgement (accepting or being non-judgemental about present moment experience). Baer, Smith and Allen (2004) report that in validating the KIMS with student samples the inventory was found to have high internal consistency and good test-retest reliability, construct and discriminant validity, with a clear four factor structure, fitting with the four aspects of mindfulness the scale was based upon; this factor structure has also been found in other studies including with clinical samples (e.g., Dekeyser, Raes, Leijssen, Leysen & Dewulf, 2008; Baum et al., 2010).

A study to validate the KIMS with clinical samples (Baum et al. 2010) found that internal consistency, reliability and correlation analyses were similar to student samples previous reported (Baer, Smith and Allen, 2004; Baer et al., 2006), and that the four mindfulness scales were sensitive to change for people who had participated in MBCT. In a further development Baer, Smith, Hopkins, Krietemeyer and Toney (2006) report on the validation of the Five Factors Mindfulness Questionnaire (FFMQ), a measure that attempts to unify various published mindfulness questionnaires into one tool. The FFMQ incorporates the 4 subscales of the KIMS and includes one additional factor (nonreactivity to inner experience; Baer et al., 2006). In studies of the FFMQ the Accept without Judgement subscale has been negatively associated with psychological symptoms, neuroticism, thought suppression, difficulties in emotion regulation, and experiential avoidance (Baer et al., 2006); all five FFMQ mindfulness scales have been found to be sensitive to change for people with chronic physical health problems who engaged in a mindfulness-based intervention (Carmody & Baer, 2008).

The Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is the other most frequently cited mindfulness measure. Brown and Ryan (2003) report that it is a unitary measure of mindfulness, consisting only of the present moment attention aspect, seen as the primary component of mindfulness that subsequently builds acceptance, non-judgement and compassion. The MAAS has been reported to have a single factor structure (Brown & Ryan, 2003; MacKillop & Anderson, 2007). Strictly speaking, the MAAS does not measure mindfulness; instead it measures "mindlessness", and makes the assumption that mindfulness can be measured by using an inverse concept (Brown & Ryan, 2003). This feature of the MAAS has been found be a substantial challenge to the construct validity to the scale (Van Dam, Earleywine & Borders, 2010).

Other multidimensional measures of mindfulness typically have a two factor approach, such as the Philadelphia Mindfulness Scale (Cardaciotto et al. 2008b), the Freiburg Mindfulness Inventory (which measures a Buddhist conception of mindfulness: Bucheld et al., 2001; Kohls et al., 2009), or multiple factors with a second-order mindfulness factor such as the Cognitive and Affective Mindfulness Scale-Revised (Feldman, Hayes, Kumar, Greeson & Laurenceau, 2007) and the Five Factors Mindfulness Questionnaire (Baer, Smith, Hopkins, Krietemeyer and Toney, 2006).

In contrast to the scales mentioned above, the Toronto Mindfulness Scale (TMS; Lau, Bishop, Segal, Buis, Anderson, Carlson, Shapiro et al. 2006) measures mindfulness as a *state*. Lau et al (2006) describe the Scale as a retrospective assessment of the subjective experience of being in a mindfulness state due to meditation techniques. The validation study of TMS demonstrated that the measure had two factors, Curiosity and Decentring, and that TMS scores improved when people had increasing meditation experience; the Decentring scale predicted improvements in clinical outcome after 8 weeks of mindfulness for people who had not engaged in meditation before. However TMS scores do not discriminate between people who have 8 weeks of meditation experience and those with 2 or more years' experience (Thompson & Waltz, 2007), suggesting that the scale may lack sensitivity. In addition the relationship between mindfulness as an everyday activity (a trait) and mindfulness as a state as measured by the TMS has not been established (Thompson & Waltz, 2007). There has been subsequent work to develop a trait version of the scale (Davis, Lau & Cairns, 2009).

For the problems related to psychosis, aside from the use of the measures described above (particularly the use of the KIMS: e.g. used in the White et al., 2011 ACT study) there has been the development of a measure specific to the experiences of psychosis, the Southampton Mindfulness Questionnaire (SMQ; Chadwick, Hember, Symes, Peters, Kuipers & Dagnan, 2008). The SMQ is a unidimensional measure of mindfulness, but includes items that suggest present moment awareness and accepting attitudes toward all experience. The SMQ has shown acceptable internal consistency, concurrent validity in showing significant associations with the MAAS, negative affect and severity of psychotic symptoms, in predicted directions (Chadwick et al., 2008). The SMQ has demonstrated positive change following participation in mindfulness groups for voices and paranoia (Chadwick, Hughes, Russell, Russell & Dagnan, 2009). Chadwick, Barnbrook & Newman-Taylor (2007) report on a version of the SMQ for voices (the SMVQ), which has shown good internal consistency, associated positively with the MAAS, and had negative correlations with negative affect, distress associated with voices, beliefs about voices omnipotence and malevolence, and resistance to voices.

For the purposes of the studies conducted as part of this thesis, it was decided to use the KIMS as a measure of mindfulness, due to the compatibility of the conception of the mindfulness

consistent with contextual approaches such as DBT and ACT (Baer, smith & Allen, 2006), rather than measure mindfulness according to Buddhist ideas (e.g., like the Freiberg Mindfulness Inventory, Kohls et al., 2009), which were not considered to be relevant to the Psychological Flexibility Model (e.g., Hayes & Shenk, 2004). At the time of this decision (July 2006) the Southampton Mindfulness Questionnaire variants were still in development, and it was unclear whether the factor structure would be consistent with the emerging consensus around two factors, or whether it would conceptually fit with a contextual paradigm.

3.3.3 Evidence for mindfulness as an empirically supported process

Mindfulness, as described above, has become a popular intervention to research. There are numerous reviews suggesting that there are benefits for mindfulness and mindfulness-based therapies in reducing stress, depression and anxiety (e.g., Baer, 2003; Burke, 2010; Carmody & Baer, 2009; Fjorback, Arendt, Ørnbøl, Fink & Walach, 2011; Keng, Smoski & Robins, 2011; Irving, Dobkin & Park, 2009; Mackenzie, Carlson, & Speca, 2005; Matchim & Armer, 2007; Praissman, 2008; Winbush, Gross, & Kreitzer, 2007).

Published meta-analyses have more systematically investigated the effects of mindfulness in a number of clinical disorders and problems. Mindfulness-based therapies have been associated with substantial reductions in anxiety and depression in mental health (Chiesa & Seretti, 2011; Hofmann, Sawyer, Witt & Oh, 2010; Klainin-Yobas, Cho & Creedy, 2012; McCarney, Schulz & Grey, 2012; Vollestad, Nielsen and Nielsen, 2011;) and in oncology settings (Ledesma & Kumano, 2008; Piet, Wurtzen and Zachariae, 2012); the prevention of relapse of major depression, at least for those who have had three or more relapses (Piet and Hougaard, 2011); better management of chronic pain (Baer, 2003; Veehof, Oskam, Schreurs & Bohlmeijer, 2011); reductions of ruminative thinking and stress for healthy people (Baer, 2003; Chiesa & Seretti, 2009); and reductions of distress in physical health conditions (Grossman, Niemann, Schmidt, & Walach, 2004).

In reviewing this literature a common challenge that is reported is in finding the specific effects for mindfulness in therapy packages that contain other evidence-based components (e.g., Chiesa & Seretti, 2009). There is a mix of ways that meta-analyses have been conducted to deal with this

issue: some meta-analyses include MBSR, MBCT, DBT and ACT, while others have limited reviews to MBSR/MBCT arguing that mindfulness is not a central intervention in the behaviour analytic therapy approaches of ACT and DBT (e.g., Burke, 2010; Hofmann, Sawyer, Witt & Oh, 2010). Another challenge in establishing robust effect sizes for mindfulness is that in some clinical areas there are a small number of studies (Burke, 2010; Dunford & Thompson, 2010); similarly there is substantial variance in the effect sizes between studies, and considerable variance in methodological rigor. Finally, there are a variety of outcomes measured in mindfulness treatment studies, ranging from established measures commonly used in outcome studies, to more theory-driven measures that have unclear construct validity and reliability. In part, this reflects differences in paradigms as discussed above: for contextual studies mindfulness outcomes are about promoting broader, flexible behavioural repertoires, while cognitive approaches focus on distress and symptom reduction as the prime outcomes (e.g., Hofmann, Sawyer, Witt & Oh, 2010).

3.4 Mindfulness-based approaches with psychosis

In addition to Acceptance and Commitment Therapy, several other mindfulness-based approaches for psychosis have been described in the empirical and clinical literatures.

The rationale for using mindfulness as a clinical intervention for psychosis is similar as for other problems and disorders: in developing present moment awareness and practicing non-judgement toward experiences through mindfulness, it may be possible to enhance coping and reduce stress (Davis & Kurzban, 2012). Additionally it may be possible for a person with positive psychotic symptoms to reduce the impact of their symptoms by having a changed relationship to them through cultivating active acceptance and non-judgement (Péréz-Alvérez et al., 2008). It can be seen that these are similar targets of change as with cognitive behavioural approaches to auditory hallucinations (e.g., Farhall et al., 2009; Trower et al., 2004), although altering the relationship may involve greater use of cognitive restructuring and behavioural experiments in CBT.

Mindfulness-based approaches for psychosis can be divided between those that teach mindfulness as a general technique (e.g., Jacobsen, Morris, Johns & Hodkinson, 2011; Johnson, Penn, Frederickson, Kring, Meyer, Catalino & Brantley, 2011; Miller, 2011) and those that have

mindfulness as a component of a formal therapy model (e.g, Chadwick, 2006). There is also a mix of training formats for mindfulness, with studies of people with psychosis being engaged in individual mindfulness sessions with a therapist, or mindfulness delivered within a group context.

3.4.1 Mindfulness as a general technique

The potential of teaching mindfulness as a technique to help people with psychosis manage affect has been explored in several small-scale, uncontrolled studies with mixed results. These studies have made the target of intervention to be reductions in, or better management of anxiety (York, 2007) or aggression (Singh et al., 2007), with significant improvements reported. However Miller (unpublished thesis, 2011) describes providing individualised mindfulness training to 10 people diagnosed with schizophrenia, and post-intervention there were improvements in levels of general distress, but not for distress related to positive symptoms, anhedonia symptoms, and quality of life. Miller (2011) reports analyses suggesting no association between improvements in mindfulness and outcomes.

3.4.2 Person-based Cognitive Therapy

Chadwick (2006) described his development of Person-based Cognitive Therapy (PBCT), a therapy approach to help people distressed by psychosis, that emphasises mindfulness and the development of metacognitive awareness to reduce experiential avoidance and entanglement with psychotic experiences. PBCT uses as a case formulation model Vygotsky's (1978) zones of proximal development to formulate clients' distress, but also their strengths and positive characteristics. This model consists of four individual zones: symptomatic meaning, relationship with experience, schemata and symbolic self, and is defined as "a social process, whereby with the support of a radically collaborative and skilled therapist, a client eases distress, develops metacognitive insight and achieves self-acceptance through proximal development in all four domains" (Chadwick, 2006).

PBCT is based upon a clinical cognitive model of psychosis (Chadwick, Birchwood & Trower, 1996; Chadwick, 2006) and the process of change is about promoting metacognitive awareness (e.g., Teasdale, 1999; Wells, 2000). By fostering the ability to decentre from thinking, acceptance of unpleasant (psychotic) sensations and self-acceptance may occur, reducing the impact of symptoms. In PBCT acceptance is a process of continually bringing mindful awareness to difficult experience, allowing an opening of awareness to all aspects of the self; this directly builds self-acceptance, because accepting psychosis means that it no longer defines the entirety of the individual (Ellett, in press).

PBCT has demonstrated mixed findings as an intervention for the problems of psychosis: In an uncontrolled study, there were shown to be significant improvements in well-being following a PBCT mindfulness group intervention (Chadwick, et al., 2005). A randomised controlled trial feasibility study of PBCT group-based mindfulness did not show significant differences between the intervention and control group; secondary analyses showed improvements in clinical functioning along with associated changes in mindfulness of thoughts and images favouring the mindfulness group (Chadwick, Hughes, Russell, Russell & Dagnan, 2009). More recently Dannahy et al. (2011) described an uncontrolled evaluation of 9 PBCT groups where 62 participants experienced 8-12 sessions of mindfulness. The authors report that post-groups there were significant improvements in well-being, distress, control and dependence upon voices.

There is evidence to suggest that PBCT may work by the processes of change outlined in the model. Abba, Chadwick and Stevenson (2008) report on a grounded theory analysis of the processes associated with mindfulness groups: they found that for the participants there was a central core process of learning to relate differently to distressing psychosis. This altered relationship appeared to be through decentering in awareness of voices, thoughts, images in the moment; allowing voices, thoughts, images to come and go without reacting/struggle; and reclaiming power through acceptance of psychosis and self (Abba, Chadwick & Stevenson, 2008).

Single case design studies have been conducted on PBCT to explore changes in process linked with outcome. Reduced believability and distress associated with voices was observed in two single cases following introduction of mindfulness intervention; in addition significant positive changes in levels of mindfulness were reported (Newman-Taylor, Harper & Chadwick, 2009). In contrast,

Lievesley (unpublished dissertation, 2008) did not find any discernable improvements or consistent patterns of change for four people who engaged in mindfulness over an 8 week intervention period.

3.4.3 Other Mindfulness Groups

Studies of other forms of group-based mindfulness intervention have been reported. Langer, Cangas, Salcedo & Fuentes (2012) investigated the impact of MBCT-style groups for 23 people with psychosis using a waiting list control design. The study used one global measure of schizophrenia symptoms along with the AAQ and the SMQ; post intervention the only significant change Langer et al (2012) report was that the intervention group had significantly higher levels of mindfulness of thoughts and images (SMQ).

Ashcroft, Barrow, Lee and MacKinnon (2011) report on a qualitative evaluation of a group mindfulness intervention, based on a PBCT model, for young people in an early psychosis service. Similar to Abba, Chadwick and Stevenson (2008), grounded theory analysis was used to investigate the nine participants' experiences of engaging in at least six sessions of mindfulness practice. It was found that all participants could describe benefits and challenges of practicing mindfulness; themes that emerged were about using mindfulness in every day settings and challenges of practicing, making sense of mindfulness and how it facilitated a greater sense of personal control, relating to people differently (possibly as a result of group processes), and greater understanding and acceptance of self.

In a similar vein, van der Valk, van de Waerdt, Meijer, van den Hout, & de Haan (2012) report an uncontrolled study of group mindfulness for people recovering from a first episode of psychosis (N=16). These 8 session groups were conducted in a four week timespan, with measures of positive and negative symptoms, general distress and the SMQ used to evaluate outcome. The results showed significant changes in levels of anxiety and agoraphobia, however no changes were found for levels of mindfulness or psychotic symptoms.

These studies combined with the PBCT group investigations along with other reports (e.g., Jacobsen, Morris, Johns & Hodkinson, 2011) suggest that people with psychosis find mindfulness

groups to be an acceptable intervention and report changes in levels of mindfulness following the groups. It is less clear whether group mindfulness interventions produce significant changes in functioning and well-being however.

3.4.4 Compassion-based mindfulness approaches

Mindfulness and acceptance are also components of interventions designed to foster greater self- and other-compassion, such as Compassionate Focused Therapy (CFT: Gilbert, 2009; Gilbert and Proctor, 2006).

CFT is based upon evolutionary social ranking theory (Gilbert, 1992), and derived from a neuroscience understanding of positive emotions. This theory suggests that there are two basic positive affect regulation systems, one focused upon achievement and doing, and another focused on contentment and social soothing. The soothing system is posited to be regulator of the threat system, which is overly activated in people with chronic problems (Gilbert & Proctor, 2006). CFT promotes the increasing awareness of negative self-to-self relating, and using skills to access and feel positive emotions of warmth and contentment, to foster greater self-compassion and activate the soothing system. It is a therapeutic approach developed to help people with high levels of shame and self-criticism (Gilbert, 2000), and has been more widely applied to people distressed by a variety of experiences, including with people with psychosis, where there are some indications that relapse, shame and avoidance are interlinked (Gumley, 2007). CFT incorporates cognitive behavioural methods such as identifying and changing safety behaviours, increasing awareness of the effects of self-critical thinking, validation, and distress tolerance, along with the use of compassionate imagery, mindfulness and self-acceptance exercises.

There have been several studies that have investigated the impact of compassion focused therapy and related interventions for people with psychosis. Mayhew and Gilbert (2008) present a case series using CFT to assist three people hearing malevolent, distressing voices. It was found that following individualised CFT all three participants reported less persecuting and malevolent voices and greater reassurance from the voices. Similarly there were improvements in general distress, including symptoms of depression, anxiety, paranoia and interpersonal sensitivity.

Gumley, Braehler, Laithwaite, MacBeth and Gilbert (2010) describe how a compassion-focused model may aid with recovery after a psychotic episode. In particular, as both a clinical intervention as well as more systematised approach to mental health services, approaches to develop greater compassion may address stigma, shame and social avoidance that may be reinforced through unhelpful styles of relating between service users and clinicians. Gumley et al (2010) outline the advantages of compassion to build resilience and social relationships in people who have had poor attachment experiences and may be prone to finding caring relationships threatening as a result, delaying seeking help when relapsing. Laithwaite and colleagues (2009) investigated the effects of a group intervention based on this conceptualisation for 19 individuals recovering after psychosis in the context of a high security special hospital. The intervention explicitly utilized group processes and peer attachment. Significant changes were found at follow up for levels of depression and self-esteem, general psychopathology, and social comparisons of self as inferior, suggesting that compassion-focused intervention may be a promising approach.

Finally, Johnson et al (2011) describe a pilot uncontrolled study of the use of loving-kindness meditation to improve negative symptoms for 18 people diagnosed with schizophrenia. The loving-kindness meditation had a similar rationale to CFT, to increase feelings of warmth and caring for self and others, as a means of broadening of the range of emotional responses and choices available (to possibly offset deficits in anticipatory pleasure associated with schizophrenia; see Gard et al., 2007). Following a six week group intervention and follow up session, it was found that there were large improvements in frequency and intensity of positive emotions, self-acceptance, and life satisfaction; there were significant decreases in anhedonia and negative symptoms. The authors conclude that this intervention is promising, although there were limitations to the study with no control group, non-blind ratings, and the use of some measures that had not been validated.

3.4.5 Summary on mindfulness with psychosis

On balance, mindfulness interventions appear to have promise for helping people distressed by psychosis to reduce the impact of their symptoms, experience greater self-acceptance and life meaning. Mindfulness appears to be a feasible and acceptable intervention in this population. Reflecting the range of different models being investigated mindfulness has been conceptualised

as a means of promoting metacognitive awareness, developing greater self-soothing and compassion, and having greater personal control over emotions and symptoms. There is some indication that mindfulness interventions promote attentional flexibility and acceptance, similar to non-psychosis clinical populations. The literature reflects the early phase of treatment development: a number of uncontrolled studies have been reported, for a range of different problems associated with psychosis, with mixed outcomes. These early promising results are strengthened if the ACT for psychosis literature is also considered: this combination suggests that the promotion of mindfulness along with values-based behavioural activation may have distinct advantages.

3.5 Chapter Implications

There is emerging evidence to suggest that the contextual approach to psychosis which promotes acceptance and mindfulness to internal experiences in general and acting on personal values from a self-accepting stance, may help to reduce the impact of psychotic symptoms, particularly in terms of believability and disruption to functioning.

However, while there is some evidence to implicate a role for EA increasing the propensity to and impact of auditory hallucinations, there is a gap in the literature about the role that EA and trait mindfulness have with dimensions of voice hearing, beliefs and responses to voices.

In addition, while there have been studies of brief ACT for psychosis showing an impact on voice hearing, interventions of longer duration and with psychometrically-robust measures have not yet been conducted. The use of a broader set of measures (than believability alone) would strengthen an ACT for voices study: this would clarify whether the processes of change consistent with the Psychological Flexibility Model , such as changes in relating to voices, acceptance, and levels of mindfulness, are linked with outcomes during and following the intervention.

Chapter 4

Experimental studies of acceptance, reappraisal and suppression

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This chapter will summarise the findings and implications from experimental studies that have investigated the effects of three regulation strategies - acceptance (discussed in Chapters 1 & 2), suppression (discussed in Chapter 1), and reappraisal.

In order to contextualise this research this chapter will outline two broad and related areas of empirical research relevant to the regulation of private experiences: the emotion regulation literature, and the research on the relationship between thought suppression and psychopathology. These two areas will be considered alongside the Psychological Flexibility Model.

The rationale will be presented for using experimental analogues to test components of the Psychological Flexibility (acceptance) and Cognitive Models (reappraisal), as well as understanding pathological processes (suppression). This will include discussion of the advantages and disadvantages of testing psychological treatment models using experimental analogues. Finally the results of experimental analogue studies of acceptance, reappraisal and suppression will be discussed in terms of the outcomes of distress intensity, stimuli tolerance and task persistence, and believability.

4.1 The regulation of private experiences: theoretical perspectives

The skillful regulation of emotions, thoughts and other private experiences is important for well-being and enables effective behaviour in pursuing life goals and valued directions, particularly as doing this means tolerance and management of a wide range of emotional states and internal experiences, including those that are uncomfortable through contact with a sense of vulnerability, risk and uncertainty (Campbell-Sills, Barlow, Brown & Hofmann, 2006; Hayes, Strosahl & Wilson, 2012; White & Gumley, 2010). As previously discussed, people who are distressed and disabled by auditory hallucinations report using a variety of regulatory approaches to cope with their voices

(e.g., Farhall & Gehrke, 1997), with varying success in terms of distress reduction, influencing the experience, and enhancing the ability to pursue meaningful goals. It has been suggested that active acceptance may be an under-utilised (Perry et al, 2011) but potentially effective strategy to manage psychotic experiences.

4.2 Emotion regulation

Emotion regulation refers to a diverse set of processes in how "individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1999, p. 557). While there are other definitions with varying emphases (e.g., Thompson, 1994; Gratz & Roemer, 2004), including whether the purpose of emotion regulation is to modify the experience of emotion or the behaviour associated with emotion, Gross' definition remains the most influential in the literature (Bloch, Moran & Kring, 2009). This definition situates emotion regulation within the self, with limited consideration of contextual factors to influence emotions (such as the behaviour of others or environment).

Gross (1998) proposed the process model of emotion regulation that delineates strategies in terms of when they have their primary impact on the emotion generation process. In this model strategies may have an effect before the emotional response has been activated (antecedent-focused), or after (response-focused). An example may be that a person who hears distressing voices may avoid situations where they feel fearful, such as contacting friends (an antecedent-focused strategy), or, if in contact with the voices and fearful, may engage in pacing or distracting herself by listening to music through earphones (a response-focused strategy).

Gross' (1998) process model distinguishes five groups of emotion regulation strategies, in temporal order: four are antecedent-focused (situation selection, situation modification, attentional deployment, cognitive change), while one is response-focused (response modulation). Antecedent-focused strategies alter the effect of emotion-generating cues, while response-focused strategies are focused on altering emotional output (e.g., action, expression). This grouping is conceptual: it is assumed that most emotion regulation attempts involve multiple regulatory processes (Werner & Gross, 2009). In terms of the strategies of interest to this chapter,

reappraisal has been conceptualised as an antecedent-focused strategy (Gross & Thompson, 2007), while suppression is seen as response-focused (Gross, 1998). John and Gross (2004) have suggested that antecedent-focused strategies may be more effective and require less effort than response-focused strategies, because an emotional response can be regulated before it has risen to an overwhelming peak. Certain cognitive researchers (e.g., Hofmann et al., 2009) have argued from the Gross (1998) conceptualisation that acceptance is a response-focused strategy, hypothesising that it is a less-effective regulation strategy than reappraisal as a consequence. In contrast, Kollman, Brown and Barlow (2009) have posited that acceptance can be considered as combining aspects of antecedent-focused and response-focused emotion regulation, as it entails both the appraisal of emotion acceptability and allowing of emotional experience after generation in the absence of efforts to control this experience. I Both reappraisal and acceptance have been identified as conceptually-distinct adaptive alternatives to the use of suppression (Gross, 1998; Hayes, Strosahl & Wilson, 1999).

This emotion regulation theory encompasses both positive and negative experiences of emotion: depending on context, emotion regulation processes may be used to make things either better or worse (Gross & Thompson, 2007). Emotion regulation in this model involves changes in the intensity or duration of the components of emotion - subjective experience, physiology and behaviour (Gross, 1998).

A meta-analysis of the habitual use of emotion regulation strategies by Aldao, Nolen-Hoeksema & Schweizer (2010) found that dispositional maladaptive strategies (i.e. suppression, rumination, avoidance) were related to symptoms of psychopathology (anxiety, depression, eating- and substance-related disorders), while dispositional adaptive strategies (i.e. reappraisal, acceptance and problem solving) were inversely related to psychopathology. Aldao et al (2010) suggest that these findings indicate that there is a pattern of functional and dysfunctional strategies within emotion regulation strategies. In this meta-analysis Aldao et al. (2010) did not directly compare the individual strategies with respect to their impact on outcome measures. It was found, however, that the maladaptive strategies were more strongly related to psychopathology than adaptive strategies, suggesting that the presence of a maladaptive strategy may have more impact than the relative absence of an adaptive one (Aldao et al., 2012); Aldao and Nolen-Hoeksema

(2011) have subsequently found that maladaptive emotion regulation strategies may moderate the influence of adaptive strategies.

4.3 Reappraisal

Reappraisal has been defined as “changing the way a situation is construed so as to decrease its emotional impact” (Gross, 2003; Lazarus & Alfert, 1964). Reappraisal may involve changing either appraisals related to the situation or appraisals regarding one's emotional responses to that situation. Reappraisal has been theorised to be a protective process against psychopathology (Gross & John, 2003) and hypothesised to be an effective means to down-regulate negative emotions.

Appraisal is considered to be a central factor in determining emotional experience (Lazarus, 1991). Lazarus (1982) described a theory of cognitive appraisal that divided into several forms (primary, secondary, and reappraisal) with further elaboration of this theory positing that distinct emotions are elicited by specific and distinctive patterns of appraisal (e.g., Smith & Lazarus, 1993). “Cognitive change” refers to changing how a person appraises the current situation so as to alter its emotional significance, either by the person changing how they think about the situation, or changing the perception of the person’s capacity to manage the demands it poses (Gross & Thompson, 2007).

4.3.1 The effects of the habitual use of reappraisal

Gross and John (2003) report that habitual use of reappraisal is associated with greater experience of positive emotion, less negative emotion, and fewer symptoms of depression. Habitual use of reappraisal has been associated with lower levels of stress-related symptoms (Moore, Zoellner and Mollenholt, 2008), lower levels of emotional arousal (Kuppens, Oravecz, & Tuerlinckx, 2010; Meyer, Smeets, Giesbrecht & Merckelbach, 2012), and better interpersonal functioning (Haga, Kraft, & Corby, 2009). Augustine and Hemenover (2009) report a meta-analytic finding that compared to other emotion regulation strategies, reappraisal is one of the most effective strategies, reducing negative affect and/or increasing positive affect. Aldao, Nolen-Hoeksema &

Schweizer (2010) report in their meta-analysis that, in comparison with other emotional regulation strategies, reappraisal was associated with less psychopathology, with a small medium effect size on levels of distress and problems.

4.3.2 Reappraisal from the cognitive therapy perspective

The process of strengthening the habitual use of reappraisal is a hallmark of Cognitive Therapy (CT): the schema-central model that underpins the intervention assumes a primary mechanism of action for CT that involves a change in biased information processing (cognitive mediation; Clark & Beck, 2010). There is evidence to demonstrate that CT reduces negative thinking (e.g., Garrett et al. 2007), alters information processing biases (e.g., Matthews et al., 1995; Mogg et al., 1996), and produces a shift from negative schema activation to endorsement of more positive beliefs (Clark & Beck, 2010). The literature is more mixed about whether these changes are specific to cognitive therapy or associated improvement in emotional processing regardless of intervention (Garrett et al., 2007).

In terms of the external validity of how reappraisal is fostered within Cognitive Therapy, it could be argued that reappraisal is used more frequently as an "on-line" strategy (Sheppes & Meiran, 2007), that is used when emotion is already evoked (e.g., a voice's comment is appraised as threatening, there is physiological responding, affect), and therefore may be considered to be response-focused rather than antecedent-focused. A possibility is that following Cognitive Therapy a person more habitually uses reappraisal as an antecedent-focused strategy, which may accord with the literature on differences in emotional reactivity post-successful cognitive therapy (e.g., Segal et al., 1999).

Allen, McHugh & Barlow (2008) describe two fundamental antecedent misappraisals: 1] the probability of a negative event happening, 2] the consequences if the negative event did happen. The aim of cognitive reappraisal is to allow for other possible interpretations that may be more likely based on the evidence, while allowing all possible appraisals to exist in the mind, without attaching too much significance to any particular one.

4.4 Suppression

There have been several forms of suppression that have been the focus of empirical interest, such as the suppression of the outward expression of emotion (Gross, 1998), and the suppression of unwanted thoughts (Wenzlaff & Wegner, 2000). As an emotion regulation strategy Gross and Levensen (1993) have defined suppression as the conscious inhibition of emotional expressive behaviour while emotionally aroused. As outlined above, the emotion regulation framework by Gross (1998) considers suppression to be a response-focused strategy; as a result of this strategy occurring late in the emotion generation process it is more effortful than antecedent focused strategies such as reappraisal, and may not be as successful (Gross, 1999; Gross & Thompson, 2007). Suppression has long been theorised to be a risk factor for psychopathology (e.g., Aldao, Nolen-Hoeksema & Schweizer, 2010; Gross, 1998).

4.4.1 Effects of habitual use of emotional suppression

In the meta-analysis by Aldao, Nolen-Hoeksema & Schweizer (2010) suppression was associated with greater psychopathology, with a medium effect size on levels of distress and problems. Gross and John (2003) report that habitual use of suppression is associated with decreased well-being, lower levels of positive emotions, poorer social adjustment, and higher levels of negative emotions. In addition habitual use of suppression has been associated with increased physiological arousal and memory impairments (Gross, 2002; Hofmann et al., 2009). Combined with the results from studies of experiential avoidance (e.g., Feldner, Zvolensky, Eifert & Spira, 2003; Sloan, 2004;), it can be concluded that the persistent use of emotional suppression is associated with increased reactivity to emotion-provoking stimuli (Campbell-Sills et al., 2006) and greater distress and poorer functioning for those who are already depressed or anxious (Hayes et al., 2004).

4.4.2 Thought suppression and control

There is a large body of evidence to suggest that efforts to avoid and suppress unwanted thoughts are commonly used within the general population, and are particularly prevalent for those with

clinical disorders, including people suffering post-traumatic stress, obsessive compulsive disorder, depression, and anxiety disorders (Abramowitz, Tolin & Street, 2001; Dalgleish and Yiend, 2006; Najmi and Wegner, 2008; Purdon, 1999; Wenzlaff and Wegner, 2000). In addition there have been investigations of the types of thought control strategies people use: Wells and Davies (1994) describe the development of the Thought Control Questionnaire (TCQ), with five subscales derived from factor analysis, measuring the use of distraction, seeking social support, reappraisal, worry, and punishment, when regulating unwanted thoughts. It has been found that the worry and punishment subscales of the TCQ are associated with greater psychopathology (e.g., Amir, Cashman & Foa, 1997; Reynolds & Wells, 1999), and that the frequency of use of thought control strategies discriminates clinical and healthy samples (e.g., Abramowitz, Whiteside, Kalsy & Tolin, 2003; Warda & Bryant, 1998;). Wegner (1994) has outlined an ironic process theory, which posits that the intention to suppress a thought instigates a monitoring process that ironically increases the cognitive accessibility of the unwanted thought, resulting in rebound effects.

The associations between efforts to engage in thought suppression, and voice-related distress and disability have been thoroughly discussed in Chapter 1. To recap this literature, it appears that voice hearers' who habitually use suppression to cope with auditory hallucinations tend to have poorer emotional and functional outcomes

4.5 Acceptance

Acceptance has been defined as "the active and aware embrace of those private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm" (Luoma, Hayes & Walser, 2007, p. 17). It is the opposite process to experiential avoidance (Hayes, Strosahl & Wilson, 1999).

The Psychological Flexibility Model suggests that attempts to engage in suppression and control of internal experiences such as thoughts, feelings, sensations and voices, may in many contexts be unhelpful, particularly if these efforts result in narrow and rigid behavioural repertoires (experiential avoidance; Chapter 2). In contrast the model posits a central role for the active acceptance of private experiences, suggesting that this can be an advantageous stance to take in

many contexts, as it allows for greater flexibility in repertoires and fosters values-based actions (thereby increasing contact with intrinsic reinforcers: Wilson, Bordieri, Flynn, Lucas & Slater, 2010).

Central to the concept of acceptance is willingness (or experiential openness) to the reality of the present moment and giving up on engaging in unhelpful efforts to control private experiences (Kollman, Brown & Barlow, 2009). Acceptance can be considered an emotion regulation strategy, although definitionally it does not involve an explicit control effort, as it is a volitional response to the occurrence of internal events that significantly impacts on emotional dynamics; moreover, it appears to be a empirically distinct process from reappraisal and perceived emotion control (Kollman, Brown & Barlow, 2009).

4.5.1 The effects of the habitual use of acceptance

The literature on the effects of the habitual use of acceptance has previously been described in Chapter 2. Hayes et al. (2006) and Bond et al (2011), in describing the aggregated literature on acceptance and psychological flexibility, report that acceptance is associated with lower levels of depression, stress, anxiety and overall psychological distress, as well as behavioural effectiveness (such as job performance, chronic pain management). Aldao et al (2010) report in their meta-analysis that acceptance had a small to medium effect size on levels of psychopathology, although non-significant in this study.

4.5.2 Perspectives on emotion regulation from Psychological Flexibility Model

As discussed in Chapter 2 acceptance is hypothesised to be a protective process against psychopathology (e.g., Hayes et al., 1996; Kashdan et al., 2006; Kashdan & Rottenberg, 2010).

In contrast, emotional and cognitive suppression have been linked in the construct of Experiential Avoidance (EA; discussed in Chapter 2), and have been theorised to be a result of normal language processes, that in some contexts lead to psychological harm (Hayes, Strosahl & Wilson, 1999).

The use of reappraisal as a strategy is not emphasised in the Psychological Flexibility Model - for the theoretical reasons discussed in Chapter 2, the potential downside of cognitive control

suggested by Relational Frame Theory is that the attempts to change the content of cognition may inadvertently strengthen language processes that maintain narrow and rigid repertoires across contexts and reinforce less functional relations, such as linking cognitive control with life success (Biglan, Hayes & Pistorello, 2008; Hayes, Barnes-Holmes & Roche, 2001). However, to date, there has not been experimental evidence to support these assertions: further, it can be argued that the cognitive control strategies that have been compared to ACT components (such as distraction, positive imagery and self-talk) are more like forms of pathological responses than analogues of cognitive reappraisal methods (Kanter, 2011). Studies that have compared reappraisal and acceptance strategies are reviewed below (Hofmann et al., 2008; Perry, Henry, Nangle & Grisham, 2012; Szasz, Szentagotai & Hofmann, 2011, 2012;).

Finally, the Psychological Flexibility Model focuses on the *function* of regulatory efforts - this is an added dimension to emotion regulation models, with the clearest example being experiential avoidance (Boulanger, Hayes, Pistorello, Kring & Sloan, 2010). This functional layer to understanding emotional regulation is less emphasised in current models (e.g., Gross & Thompson, 2007). Thus the use of reappraisal needs to be considered within context: this strategy could be part of engaging in values-based behaviour, or serve an experiential avoidance function. There is evidence to suggest that experiential avoidance mediates the impact of a variety of coping and emotional regulation processes, including cognitive reappraisal, controllability of stressors, anxiety sensitivity, and emotional response styles, demonstrated in correlational and longitudinal designs (Kashdan et al., 2006).

4.6 Experimental analogues for acceptance, reappraisal and suppression: a rationale

Both cognitive and contextual approaches to psychotherapy rely upon experimental studies to test treatment components and develop new intervention methods (Clark, 2004; Vilardaga, et al., 2009).

There are advantages and disadvantages to using experimental analogues. The advantage of these studies is that they allow for the investigation of important theoretical questions in highly controlled settings, so that the effects on outcomes of experimental manipulations can be more

clearly demonstrated. This enables researchers to test treatment components and explore processes of change outside of using randomised controlled trials, and to develop new interventions, strengthening the link between empirically-based interventions and basic science (Clark, 2004; Clark & Beck, 2010). The external validity trade-off of greater experimental precision and control potentially allows for an understanding of the mechanisms (or contextual effects) of a treatment component that could not be achieved in treatment outcome research (Hayes, Levin, Plumb-Vilardaga, Villatte & Pistorello, 2011; Kazdin, 1978;). Similarly experimental analogues allow for the use of comparison conditions that would not be practical or ethical to use (e.g., such as single strategy coping; using potentially iatrogenic strategies like rumination or suppression; Levin et al., 2012). A final advantage to using experimental analogues is that these designs are smaller and less costly than treatment trials, and allow for refinement of theory and treatments if theoretically-derived components do not perform as hypothesised (Clark, 2004; Levin et al., 2012).

In terms of disadvantages, experimental analogues may involve a level of abstraction that challenges the generalisability of results in a number of ways. There may be a trade-off in designing experiments with high internal validity, where procedures and samples are tightly specified to better determine causality, which can result in limited generalizability of the findings (Campbell, 1957). Thus there is a risk that the analogues of psychological treatment components may be less generalizable to the clinical context. For example various responses may be used as proxies for clinically-relevant phenomena, such as the use of task persistence as a measure of willingness in studies of acceptance (e.g., Gutiérrez et al., 2004). The regulation strategies that are the focus of this chapter have been assumed to be analogous to components of ACT (acceptance) and Cognitive Therapy (reappraisal); in addition suppression has been assumed to be analogous to the construct of unhelpful experiential control that is implicated in the Psychological Flexibility Model. However, the concept of experiential avoidance is broader than suppression (Bond et al., 2011; Hayes et al., 1996); similarly both ACT and CT have a broader set of components than just acceptance and reappraisal, respectively. For example, the Cognitive Therapy approach for distressing voice hearing has a central component of changing behavioural responses associated with compliance with voices (i.e., a change in the relationship to voices), in addition to altering the use of safety behaviours (Trower et. al, 2004).

On balance it can be argued that the advantages to using experimental analogues outweigh the disadvantages, particularly in advancing the development of empirically-based components of cognitive-behaviour treatment packages. The experimental investigation of treatment components is dissimilar to the efficacy questions that can be addressed through randomised controlled designs; these analogues are not a test of the outcomes of these multi-component treatments.

From this perspective, experimental studies have provided support for aspects of the cognitive model for a number of disorders (e.g., Clark et al., 1988; Radomsky, Rachman & Hammond, 2001; Ross, Freeman, Dunn & Garety, 2011; Salkovskis et al., 1999; Teasdale & Bancroft, 1977; Teasdale & Fogarty, 1979). Similarly experimental support has been demonstrated for contextual processes described by the Psychological Flexibility Model and RFT (e.g., Forman et al., 2007; Masuda, Hayes, Sackett & Twohig, 2004; Smyth, Barnes-Holmes & Forsyth, 2006; Villatte et al., 2010). Levin, Hildebrandt, Lillis and Hayes (2012) present a meta-analytic review of experimental studies testing components that relate to the psychological flexibility model (acceptance, defusion, values, present moment, self as context, committed action): it is reported that compared to inactive conditions, psychological flexibility components show large effect sizes and in expected directions. Levin et al (2012) also report that, compared to conditions that promote experiential control, there were small but significant effect sizes favouring psychological flexibility, and medium effect sizes relative to conditions promoting cognitive fusion (rumination, worry conditions); there were no differences in size of effect between distressed and convenience samples (e.g., students).

The literature reviewed in this chapter has explored the use of acceptance, reappraisal and suppression largely for analogues of anxiety, depression, pain and trauma, using mostly healthy samples (some clinical samples, e.g., Campbell-Sills at al., 2006; Najmi, Riemann & Wegner, 2009; Vowles et al., 2007;). These studies have been conducted from the theoretical perspectives of the Psychological Flexibility Model, as well as emotion regulation research and information processing accounts of clinical phenomena. There has been one experimental study conducted with a sample of people with psychosis exploring differences in trained emotional regulation strategies (Perry, Henry, Nangle, & Grisham, 2012: described below); there have been no studies of emotion regulation strategies conducted with stimuli analogous to the experience of hearing voices. [There

have been studies that have investigated the potential of simulating auditory hallucinations in order reduce stigma toward people with schizophrenia, see Ando, Clement, Barley & Thornicroft, 2011, for a review].

4.7 Experimental instructions

This section will describe the typical procedures for training participants to engage in acceptance, reappraisal and suppression as regulation strategies within experimental analogues.

4.7.1 Acceptance instructions

Instructions for acceptance typically involve training participant to respond to the experimental condition in an experientially-open manner, by practicing willingness toward any internal experiences, present-moment awareness and mindfulness.

A way of providing instructions for acceptance that is theoretically consistent with ACT is through the use of metaphor. As discussed in Chapter 2 the experiential approach of ACT suggests that metaphor may be an effective means of helping people recognise their problems and indicate possible, but unexpected, behavioural alternatives (Heffner, Greco, & Eifert, 2003; McCurry & Hayes, 1992). Metaphorical talk may work through using figurative language to synthesise emotionally-relevant experiences in a non-confrontational and non-threatening way, and by indirectly suggesting contingencies, where acceptance is reinforced and emotional avoidance and control is punished (Barnes-Holmes, Cochrane, Barnes-Holmes, Stewart & McHugh, 2004; Eifert & Heffner, 2003).

The “Swamp Metaphor” (Hayes, Strosahl & Wilson, 1999) has been frequently used in experimental studies (e.g., Kehoe et al., 2005; McMullen et al., 2008): this metaphor describes the experience of engaging in a valued action and coming into contact with aversive experiences, such as unwanted feelings and thoughts, as analogous with willingly walking through a swamp in order to get to where you planned to go. The metaphor encourages willingness and acceptance of these unwanted experiences that are dignified by being part of a larger chosen direction (values).

It has been noted that studies that provide acceptance instructions without the use of metaphor or experiential methods (e.g., Hofmann, Heering, Sawyer, & Asnaani, 2009) tend to show lower effects for the acceptance condition. The meta-analysis by Levin et al (2012) demonstrated that larger effect sizes are seen for experimental acceptance conditions that include experiential methods, compared to those that include only a rationale. In addition several studies that have shown superior acceptance effects have embedded this strategy within a values-based context (Branstetter-Rost et al., 2009; Páez-Blarrina, Luciano, Gutiérrez-Martínez, Valdivia, Rodríguez-Valverde, et al., 2008).

4.7.2 Reappraisal instructions

Several different types of reappraisal instructions have been reported: consistent with the work by Gross (1998) most studies have instructed participants to reappraise by thinking objectively to decrease emotional reactivity to the aversive stimuli (e.g., Goldin et al., 2008; Ochsner et al., 2002; Perry et al., 2012); in other studies participants have been instructed to consider the negative perspective of the stimuli (e.g., Szasz et al., 2012, with the negative health consequences of smoking), or to consider the positive things they may get from the situation (e.g., Rood et al., 2012). Schartau, Dalgleish and Dunn (2010) describe four "reappraisal themes" used in experimental instructions, to help participants to adopt a broader perspective toward the aversive situation so that positive or adaptive information can be integrated:

1) Bad things happen - bad things happen in the world and I need to put them behind me and move on.

2) Silver lining - there are usually some good aspects to every situation and it is important to focus on these.

3) Broader perspective - bad events are rare overall and lots of good things are happening all of the time.

4) Time heals - in the (near) future, this will not seem anywhere near as bad as it does now.

It is unclear whether there are systematic differences between these various instructions for reappraisal in terms of experimental outcomes; based on the published literature, to date this question has not been investigated.

4.7.3 Suppression instructions

There have been several types of suppression instructions reported in the literature: emotion suppression instructions have involved instructing participants to not show any emotion while engaged in the experimental task (typically watching distressing film clips), so that a person watching the participant would not know that they were experiencing any emotion (Richards & Gross, 1999). Other instructions have presented suppression of thoughts and feelings as consistent with effective self-control and appealed to the participant's personal history of successfully using control (e.g., Campbell-Sills et al., 2006; Levitt et al., 2004): these instructions have told participants that they can control their feelings by pushing them away, and reminded them that they have been successful at self-discipline in the past. In addition these instructions have used similar metaphors as the comparison conditions, but slanted toward suppression: for example, in the Levitt et al (2004) study an ACT metaphor "Tug of War with the Monster" (Hayes, Strosahl & Wilson, 1999) was used to encourage emotional control (by pulling the rope to beat the monster), instead of the usual purpose of the metaphor, to instruct acceptance (by letting go of the rope/ struggle). Finally, within the literature exploring thought suppression from an ironic process theory perspective (Wegner, 1994) participants are told to suppress or block out the target thought, and to continue to try not to think about it while reporting the thoughts that come to mind during a recall period of several minutes (Wentzlaff & Wegner, 2000).

4.8 Multiple outcomes in experimental studies of emotion and thought regulation

A number of different outcome variables have been used to investigate the effects of emotion regulation in experimental studies (Werner & Gross, 2009, for a review). Emotion regulation can influence levels of physiological arousal, the perception of how distressing aversive stimuli are,

levels of affect and distress, as well as behavioural task persistence and tolerance of the stimuli (both typically measured by how long a participant chooses to stay in contact with aversive stimuli, and whether they tolerate repeated exposure to stimuli) (Aldao, Nolen-Hoeksema & Schweizer, 2010; Gross & Thompson, 2007). There have also been differences reported about impaired memory performance related to the use of suppression (Cambell-Sills, Barlow, Brown & Hofmann, 2006). The thought suppression literature has used as outcomes the presence and frequency of target thoughts, as well as affect (Wenzlaff and Wegner, 2000). Finally, experimental outcomes have been reported for the *believability* of thoughts related to aversive experiences (e.g., Masuda et al., 2010; McMullen et al., 2008): this is a measure of how strongly the participant considers it necessary to act upon the thought (Kohl, Rief & Glombiewski, 2012). An example of this would be when a participant has thoughts that the aversive stimuli in an experimental condition are "too much" and acts to avoid or stop participation in the condition.

4.9 Current status of the experimental effects of acceptance, reappraisal and suppression

4.9.1 Search strategy

The studies reviewed for this chapter were the outcome of the following search strategy.

Electronic literature searches were conducted in PsychInfo, PubMed and Google Scholar from 1990 to mid-2012, with the following combination of search terms used: [Acceptance OR Experiential Avoidance OR Distancing OR Mindfulness OR Defusion] AND [Suppression OR Reappraisal OR Rumination OR Distraction OR Control]. Abstracts for studies were then checked for eligibility (see below), and the full article retrieved if it fulfilled the following criteria:

1) Published in an English language journal, with the year of publication between 1990 and June, 2012
2) Recruited human participants
3) Used an experimental design

4) Compared acceptance, reappraisal or suppression strategies with other emotion regulation strategies or a control condition.

Dissertations and single case studies were excluded. For all selected studies the reference list was checked against the search results, and additional studies meeting the inclusion criteria were added.

4.9.2 *A priori* hypotheses regarding the experimental literature

The experimental literature was approached with the following a priori hypotheses, based upon the emotion regulation and psychological flexibility literature (discussed above):

1) It was predicted that reappraisal would show a comparative advantage over acceptance in distress intensity.
2) It was predicted that acceptance would show a comparative advantage over reappraisal in behavioural task persistence/ tolerance of aversive stimuli.
3) It was predicted that acceptance would show a comparative advantage over reappraisal in reduced believability of thoughts related to experimental challenges.
4) It was predicted that suppression would show comparative disadvantages to both acceptance and reappraisal conditions on all three outcomes (distress intensity, tolerance, believability).

The studies reviewed for this chapter appear in Tables 4.1 (Acceptance) and 4.2 (Reappraisal). The results of these studies have been summarised in terms of whether the acceptance or reappraisal condition was comparatively better, worse or equivalent to comparison conditions. There were three outcomes of interest for this review – pain/ distress intensity, tolerance and believability; these outcomes were chosen as they have been used in the widest number of studies (pain/distress intensity, tolerance) or are of theoretical interest from the perspective of the Psychological Flexibility Model and for the focus of this thesis (believability).

For pain/distress intensity, and believability, regulation strategies were judged by whether they produced a comparative reduction; for tolerance, whether the strategy resulted in a comparatively longer length of time exposed to the challenge or willingness to undergo repeated exposures.

4.9.3 Variety of psychological challenges reported

As can be seen from Table 4.1 there are a number of experimental studies that have investigated the influence of acceptance vs. control-based strategies upon the tolerance of aversive stimuli (e.g., Feldner, Zvolensky, Eifert & Spira, 2003; Hayes, Bisset, Zorn, Zettle, Rosenfarb, Cooper & Grundt, 1999;). In these studies, which have used both healthy and clinical samples, the aversive stimuli presented have included physiological symptoms associated with panic (e.g., Eifert & Heffner, 2003), induced pain (e.g., Guiterrez, Luciano, Rodriguez & Fink, 2004)and unpleasant visual images (e.g., Campbell-Sills et al., 2006). There have also been several studies that induced intrusive thoughts as the psychological challenge (e.g., Marcks & Woods, 2005; Najmi, Riemann & Wegner, 2009).

Table 4.1a Comparison of studies of Acceptance vs Other Strategies on pain/distress intensity, tolerance and believability

Study	Sample characteristics & size	Challenge	Experimental Conditions	Intensity/ Distress	Tolerance	Believability
Branstetter-Rost, Cushing & Douleh (2009)	Non-clinical (95 students)	Cold Pressor	1) Acceptance 2) Neutral (reading)	↓	↑	↑
Roche, Forsyth & Maher (2007)	Non-clinical (20 students)	Cold Pressor	1) Acceptance 2) Mental control	↑	↑	
Masedo & Esteve (2007)	Non-clinical (219 students)	Cold Pressor	1) Acceptance 2) Suppression 3) Spontaneous coping	↑	↑	
Keogh et al. (2005)	Non-clinical (62 students)	Cold Pressor	1) Acceptance 2) Distraction	↑	♦	
Hayes et al. (1999)	Non-clinical (32 students)	Cold Pressor	1) Acceptance 2) Positive self-verbalisation, breathing control 3) Placebo, education about pain	↓	↑	
Paez-Blarrina et al. (2008a)	Non-clinical (30 students)	Electric shocks	1) Acceptance 2) suppression	♦	↑	↑
Paez-Blarrina et al. (2008b)	Non-clinical (20 students)	Electric shocks	1) Acceptance 2) suppression	♦	↑	↑
McMullen et al. (2008)	Non-clinical (80 students)	Electric shocks	1) Acceptance 2) Distraction	↓	↑	↑

results favour Acceptance ↑
results were equivalent between conditions ♦
results favour comparison condition(s) ↓

Table 4.1b Comparison of studies of Acceptance vs Other Strategies on pain/distress intensity, tolerance and believability

Study	Sample characteristics & size	Challenge	Experimental Conditions	Intensity/ Distress	Tolerance	Believability
Guitterez et al.(2004)	Non-clinical (40 students)	Electric shocks	1) Acceptance 2) Control pain, positive thoughts + distraction	↓	↑	↑
Eifert & Heffner (2003)	High anxiety sensitive females (60)	CO_2 challenge	1) Acceptance 2) Breathing control	♦	↑	
Feldner e al. (2003)	Non-clinical (48)	CO_2 challenge	1) Acceptance 2) suppression	♦		
Levitt et al. (2004)	Panic disorder patients (60)	CO_2 challenge	1) Acceptance 2) Suppression 3) Neutral (reading)	↑	↑	
Healey et al. (2008)	Non-clinical (60 students)	Positive and negative self-statements	1) Acceptance/ decrease word meaning 2) Increase word meaning 3) Neutral word meaning	↑ (negative statements)	↑	↑ (negative statements) ♦ (positive statements)
Masuda et al.(2010)	Non-clinical (132 students)	Negative self-referential thoughts	1) Acceptance 2) Distraction 3) Neutral (reading)	↑		↑
Kuehner, Huffziger & Liebsch (2009)	Non-clinical (60 students)	Mood induction(music) + recall of negative mood events	1) Acceptance 2) Distraction 3) Rumination	♦		↑(vs rumination) ♦ (vs distraction)

results favour Acceptance ↑
results were equivalent between conditions ♦
results favour comparison condition(s) ↓

Table 4.1c Comparison of studies of Acceptance vs Other Strategies on pain/distress intensity, tolerance and believability

Study	Sample characteristics & size	Challenge	Experimental Conditions	Intensity/ Distress	Tolerance	Believability
Najmi, Riemann & Wegner (2009)	OCD patients (20) Non-clinical (20)	Focus on intrusive thoughts	1) Acceptance 2) Distraction 3) Suppression	↑ (OCD) ♦ (non-clinical)		↑(vs suppression: OCD) ♦(vs distraction: OCD) ♦(vs distraction/ suppression: non-clinical)
Marcks & Woods (2005)	Non-clinical (103 students)	Intrusive thoughts	1) Acceptance 2) Suppression 3) Monitor only 4)	↑		♦
Broderick (2005)	Non-clinical (177 students)	Mood induction	1) Acceptance 2) Rumination 3) Distraction	↑		↑(vs rumination) ♦ (vs distraction)
Vowles et al. (2007)	Chronic lower back pain patients (74)	Physical impairment index	1) Acceptance 2) Control of pain 3) Continued practice 4)	♦	↑	
Campbell-Sills et al.(2006)	Anxiety or mood disorder patients (60)	Emotional film	1) Acceptance 2) Suppression	↑		

results favour Acceptance ↑
results were equivalent between conditions ♦
results favour comparison condition(s) ↓

Table 4.1d Comparison of studies of Acceptance vs Other Strategies on pain/distress intensity, tolerance and believability

Study	Sample characteristics & size	Challenge	Experimental Conditions	Intensity/ Distress	Tolerance	Believability
Erisman & Roemer (2010)	Students - scoring high on emotion regulation difficulties (30)	Affectively mixed film clips	1) Acceptance (mindfulness) 2) Neutral educational material	↑		
Singer & Dobson (2007)	Remitted depressed (80)	Mood induction	1) Acceptance 2) Distraction 3) rumination	↑(vs rumination) ♦ (vs distraction)		
Huffziger & Kuehner (2009)	Remitted depressed (76)	Mood induction	1) Acceptance 2) Distraction 3) rumination	↑(vs rumination) ♦(vs distraction)		
Westin, Ostergren & Andersson (2008)	Tinnitus patients (47)	White Noise	1) Acceptance 2) Suppression 3) Distraction	♦		
Dunn et al. (2009)	Non-clinical (89)	Distressing Film; Affective picture task	1) Acceptance 2) Rumination 3) No Strategy	♦(distressing film) ↑(affective pic)		
Luciano et al. (2010)	Non-clinical (35 students)	Loud Noises	1) Acceptance 2) Control-based strategy	↑		

results favour Acceptance ↑
results were equivalent between conditions ♦
results favour comparison condition(s) ↓

Table 4.2a Comparison of studies of Reappraisal vs Other Strategies on distress/ intensity, tolerance and believability

Study	Sample characteristics & size	Challenge	Experimental Conditions	Intensity/ Distress	Tolerance	Believability
Szasz, Szentagotai & Hofmann (2012)	Smokers (94 students)	Smoking cravings	1) Reappraisal 2) Acceptance 3) Suppression	↑	↑	
Szasz, Szentagotai & Hofmann (2011)	Non-clinical (73 students; with moderate levels of anger on task)	Frustrating Task	1) Reappraisal 2) Acceptance 3) Suppression	↑	↑	
Wolgast, Lundh & Viborg (2011)	Non-clinical (94)	Film Clips	1) Reappraisal 2) Acceptance 3) Neutral (condition)	↑ (Disgust clips) ♦ (other clips)	↑ (vs neutral) ♦(vs acceptance)	
Perry et al. (2012)	Non-clinical (24)	Film Clips	1) Reappraisal 2) Suppression 3) Acceptance	↑ (vs acceptance) ♦ (vs suppression)	↓	
Hoffman et al. (2009)	Non-clinical (201 students)	Impromptu Speech	1) Acceptance 2) Reappraisal 3) Suppression	↑	♦	
McRae et al. (2010)	Non-clinical (18 females)	Affective Pictures	1) Reappraisal 2) Distraction	↑		
Ochsner et al.(2002)	Non-clinical (15 females)	Affective Pictures	1) Reappraisal 2) Distraction	↑		

results favour Reappraisal ↑
results were equivalent between conditions ♦
results favour comparison condition(s) ↓

Table 4.2b Comparison of studies of Reappraisal vs Other Strategies on distress/ intensity, tolerance and believability

Study	Sample characteristics & size	Challenge	Experimental Conditions	Intensity/ Distress	Tolerance	Believability
Goldin et al. (2008)	Non-clinical (17 females)	Film Clip (negative emotion eliciting)	1) Reappraisal 2) Suppression	↑		
Gross (1998)	Non-clinical (120 students)	Disgust Film	1) Reappraisal 2) Suppression	↑		
Jackson et al. (2000)	Non-clinical (48 students)	Disgust Film	1) Reappraisal 2) Suppression	↑		
Ehring et al. (2010)	Students: a) Remitted depression(30) b) Never depressed (43)	Sad Film	1) Reappraisal 2) Suppression	↑(for both groups)		
Aldao & Mennin(2012)	Generalised Anxiety Disorder (80)	Mood Films	1) Reappraisal 2) Acceptance	↑		
Ray, Wilhelm & Gross (2008)	Non-clinical (82 female students)	Angry Memory	1) Reappraisal 2) Rumination	↑		
Rood et al. (2011)	Non-clinical adolescents (160)	Memory of stressful event	1) Reappraisal 2) Rumination 3) Acceptance 4) Distancing	↑		

results favour Reappraisal ↑
results were equivalent between conditions ♦
results favour comparison condition(s) ↓

Studies of the experimental effects of reappraisal have not involved pain or panic analogues, which do not allow direct comparison with the effects of acceptance for these types of challenges. Experimental studies of reappraisal (Table 3.2) have typically involved participant exposure to film clips that induce disgust, fear or sadness (e.g., Ehring et al., 2010; Goldin et al., 2008; Gross, 1998; Schartau, Dalgleish & Dunn, 2009; Wolgast et al., 2011); other studies have used affective pictures (McRae et al., 2010; Ochswer et al., 2002;), participating in frustrating tasks (Szasz et al., 2011), cued cravings (Szasz et al., 2012) or conditions where participants are asked to recall angry or stressful memories (Ray et al., 2008; Rood et al., 2011). Most reappraisal studies have involved non-clinical samples; however, there are studies that have also involved people with generalised anxiety disorder (Aldao et al., 2012), schizophrenia (Perry et al., 2012; described below) or those who have recovered from depressive episodes (Ehring et al., 2010).

4.9.4 Comparison conditions

Acceptance and reappraisal have usually been compared to regulation strategies that are regarded as unhelpful or ineffective, that can be considered as analogues of disorder processes: examples of this include comparisons to suppression (e.g., Hofmann et al., 2009; Levitt et al., 2004;) and rumination (e.g., Broderick, 2005; Kuehner, Huffziger & Liebsch, 2009).

Acceptance has also been compared to experimental instructions for experiential control in investigations of the Psychological Flexibility Model (where experiential control is predicted to be less effective), such as studies where participants were taught diaphragmatic breathing in carbon dioxide challenge tasks (e.g., Eifert & Heffner, 2003; Levitt, Brown, Orsillo & Barlow, 2004), to control pain through self-discipline (Vowles et al., 2007), to engage in suppression/ experiential avoidance (e.g., Luciano et al., 2010), use positive self-statements (Guitterez et al., 2004; Hayes, Bisset, Zorn, Zettle, Rosenfarb, Cooper & Grundt, 1999;) and relaxation training (e.g., Hayes et al., 1999)

Finally several studies have compared acceptance to distraction (e.g., Guiterrez et al., 2004; Keogh et al., 2005; McMullen et al., 2008; Najmi, Riemann & Wegner, 2009); and one study has compared reappraisal with distraction (McRae et al., 2010). Based upon the broader experimental evidence distraction has been argued to be an effective strategy for emotion regulation, in particular, for improving affect and limiting the use of rumination (Augustine & Hemenover, 2009; Nolen-Hoeksema & Morrow, 1993), and reducing negative cognitions (Fennell & Teasdale, 1984). Thus, it can be suggested that studies that use a distraction condition may be comparing acceptance and/or reappraisal with another potentially effective regulation strategy.

The experimental effects of acceptance, reappraisal and suppression will be considered in the remainder of this section

4.9.5 Effects on pain/distress intensity of psychological challenges

4.9.5.1 Acceptance

There are mixed findings for the effect of acceptance on the intensity of pain. In studies of induced pain (cold pressor, shocks): acceptance has been associated with greater pain intensity compared to instructions that were inert (Branstetter-Rost et al., 2009), or involved distraction (McMullen et al., 2008) and positive thinking (Gutiérrez et al., 2004; Hayes et al., 1999;). One study found no differences on shock intensity compared to suppression (Paez-Blarrina et al., 2008). There are several studies where acceptance has been associated with less pain intensity, compared to positive thinking, suppression and distraction (Roche et al., 2007; Masedo & Rosa Esteve, 2007; Keogh et al., 2005, respectively). There are several possible explanations for these differing results. There is a greater variance of pain intensity outcomes in the cold pressor experiments, compared to the electric shock studies (with either no difference or worse outcomes compared to suppression or distraction). It may be that pain intensity is heightened (or at least not comparatively reduced) by acceptance when the pain experience involves brief, acute and repeated exposures (electric shocks). There may have also been variable outcomes due to the experimental instructions used: in the cold pressor studies these varied in terms of their length

and format, from brief instructions for acceptance versus control (Keogh et al., 2005), through to lengthy exercises and metaphors (Masedo & Rosa Esteve, 2007; Paez-Blarrinaet al., 2008).

In terms of levels of distress, acceptance in a carbon dioxide challenge produced equivalent effects to breathing control and suppression in non-clinical samples (Eifert & Heffner, 2003; Feldner et al., 2003), but was associated with less distress compared to suppression and neutral instructions for a sample of people with panic disorder (Levitt et al., 2004). This could suggest the possibility that acceptance is a more effective strategy when people are prone to experiencing strong physiological responses. In a similar vein, the use of acceptance following distressing film clips suggest that acceptance is associated with reduced distress when compared to inert and suppression instructions with clinical and high-trait anxiety samples (Campbell-Sills et al., 2006; Erisman & Roemer, 2010), but inconsistent effects when compared to rumination instructions with a non-clinical sample (Dunn et al., 2009).

Experiments that have involved mood induction have demonstrated that acceptance results in less distress when compared to rumination with people who have recovered from depressive episodes (Huffziger & Kuehner, 2009; Singer & Dobson, 2007) but equivalent levels of distress with the use of distraction. Similar studies with non-clinical samples have produced inconsistent results, with Kuehner, Huffziger & Liebsch (2009) reporting equivalent levels of distress across acceptance, distraction or rumination conditions, while Broderick (2005) reported superior effects for the use of acceptance. The Broderick (2005) study had a much larger sample size compared to Kuehner et al. (2009), possibly having greater power; another difference between the studies was that while Kuehner et al (2009) provided a rationale for using mindful acceptance, Broderick (2005) trained participants using an experiential exercise.

There are more consistent results for whether training in acceptance leads to lower distress when intrusive thoughts are induced: in non-clinical samples acceptance has been found to be superior to distraction (Masuda e al., 2010), suppression (Marcks & Woods, 2005), and self-relevant appraisal (Healey et al., 2008). Najmi, Riemann & Wegner (2009) comparing non-clinical and obsessive-compulsive disorder (OCD) samples, found that for the OCD group acceptance was superior to distraction and suppression for limiting distress associated with intrusive thoughts. However for the non-clinical group the different strategies had equivalent distress level outcomes:

again, it may be that acceptance is comparatively effective in reducing distress levels for those participants who already prone to finding negative experiences challenging.

4.9.5.2 Reappraisal

Studies of the effects of reappraisal suggest that this strategy reduces distress and arousal during psychological challenges, when compared to other regulation strategies (e.g., Gross, 1998, 2002; Jackson, Malmstadt, Larson, & Davidson, 2000; Richards & Gross, 2000; Schartau, Dalgleish & Dunn, 2009).

Following exposure to distressing film clips or affective picture tasks non-clinical participants report less distress in reappraisalconditions when compared to suppression (Ehring et al., 2010; Goldin et al., 2008; Gross, 1998; Jackson et al., 2000;), distraction (McRae et al., 2010; Ochsner et al., 2002), and acceptance (Perry et al., 2012; Wolgast, Lundh & Viborg, 2011;). An inconsistent finding was that Perry et al (2012) found equivalent distress levels between reappraisal and suppression, but not acceptance (which was worse) with a small non-clinical sample; the authors suggested that a possibility is that suppression is not an emotionally costly strategy in terms of distress for non-clinical participants (see below for a further description of this study). Two studies with clinical samples have found that reappraisal is superior to acceptance (Generalised Anxiety Disorder: Aldao & Mennin, 2012) and suppression (participants remitted from depression: Ehring et al, 2010).

Reappraisal has also been found to be associated with less distress when recalling angry or stressful memories in non-clinical samples, when compared with rumination or acceptance (Ray, Wilhelm & Gross, 2008; Rood et al., 2011). Similarly, when faced with a threatening (an impromptu speech: Hofmann et al., 2009) or frustrating task (Szasz, Szentagotai & Hofmann, 2011), or smoking cravings (Szasz, Szentagotai & Hofmann, 2012), non-clinical participants report comparatively less distress following reappraisal, than when using acceptance or suppression as regulation strategies. In addition there is evidence to suggest that reappraisal is not as taxing cognitively as suppression, with participants in reappraisal conditions having greater recall of material (Richards & Gross, 2000).

4.9.5.3 Suppression

As can be deduced from the discussion above, the weight of the experimental evidence strongly suggests that suppression is an ineffective method for coping with challenges, producing comparative increases in physiological arousal (Gross, 1998), distress (e.g., Ehring et al., 2010; Levitt et al., 2004; Masedo & Esteve, 2007;), as well as rebound effects and associated negative affect in target thoughts (Marcks & Woods, 2005; Wegner & Gold, 1995; Wegner and Wenzlaff, 1996; Wegner & Zanakos, 1994;). Suppression does appear to work to inhibit outward expression of emotion, but does not alleviate the subjective experience of emotion (Gross & Levenson, 1997); in fact use of suppression may lead to a paradoxical increase in the unwanted experience (Cioffi & Holloway, 1993; Gross, 1998). These counterproductive effects of suppression have been shown for a range of emotions, such as sadness, disgust, and amusement (Gross, 1998). Moreover, people who are already high in trait experiential avoidance and instructed to engage in suppression may experience increased distress and poorer task performance, compared to those low in this trait (e.g., Feldner et al., 2003; Kashdan, Barrios, Forsyth & Steger, 2006).

4.9.6 Effects on Tolerance and Task Persistence

4.9.6.1 Acceptance

Unlike the mixed findings for intensity of distress, the majority of studies have demonstrated that participants in acceptance conditions will engage in greater task persistence and display greater willingness to experience unpleasant stimuli (e.g., pain induced by a cold pressor task, electric shocks, films with unpleasant images), compared to conditions that have instructions for distraction (Gutiérrez et al., 2004; McMullen et al., 2008;), emotional suppression (Levitt, Brown, Orsillo & Barlow, 2004; Masedo & Rosa, 2007; Paez-Blarrina et al., 2008) use of positive thinking (Hayes et al., 1999; Roche et al., 2007;), experiential control (Feldner, Zvolensky, Eifert & Spira, 2003), and diaphragmatic breathing to reduce arousal (Eifert & Heffner, 2003; Hayes et al., 1999). Participants persist with contact with aversive stimuli after being trained in acceptance, while reporting little difference in levels of distress compared to other conditions (e.g., McMullen et al., 2008). However a few studies have found equivalent task persistence for those in the acceptance

condition compared to participants trained in suppression (a second experiment reported in Paez-Blarrina et al., 2008), and distraction (Keogh et al., 2005). Possible explanations for these differing results include a small sample size, limiting study power (Paez-Blarrina et al., 2008), and the use of brief, rationale-based instructions without an experiential component that may have limited the effect of acceptance (Keogh et al., 2005), in comparison to other studies (see Levin et al., 2012).

4.9.6.1 Reappraisal

There are inconsistent results for the effects of reappraisal on tolerance and task persistence (or reduced task avoidance). Reappraisal has been reported to produce greater task persistence than acceptance or suppression for a frustrating task, and with smoking cravings (Szasz, Szentagota & Hofmann, 2011, 2012), but not produce greater length of impromptu speeches. Similarly inconsistent results have been found when participants are exposed to film clips that induce disgust: Wolgast et al. (2011) report no significant difference for reappraisal compared to acceptance in increasing the willingness of participants to undergo further film clips, while Perry et al (2012) found that reappraisal was associated with lower tolerance compared to acceptance. One possible explanation for these inconsistent results are the differences between studies on the types of instructions used: for example, Szasz et al (2012) instructed the reappraisal condition to cue the participants to think about the negative consequences of smoking cigarettes, while in the Wolgast et al (2011) study participants were instructed to reappraise film clips in an unemotional way. Similarly the Hofmann et al. (2009) impromptu speech study instructed participants to take a realistic perspective on the task and realise that the situation did not pose a threat. It is possible that the differing emotional outcomes of these reappraisal instructions may have had an impact on tolerance and task persistence.

4.9.6.1 Suppression

Finally, as above, suppression as a comparison condition to reappraisal and acceptance has been demonstrated to result in reduced task persistence (e.g., Paez-Blarrina et al., 2008), distress tolerance (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Feldner, Zvolensky, Eifert & Spira, 2003;) and pain tolerance (e.g., Masedo & Rosa, 2007). In addition the use of suppression

has been found to have deleterious effects on short-term memory, compared to cognitive reappraisal (Richards & Gross, 2000).

4.9.7 Effects on Believability

A small number of studies have demonstrated that participants trained in acceptance report lower levels of believability compared to suppression (Najmi, Riemann & Wegner, 2009; Paez-Blarrina et al., 2008;), positive thinking (Guitierrez et al., 2004) and rumination conditions (Broderick, 2005; Kuehner et al., 2009). The results of the Healy et al. (2008) study raise the possibility that the reduction of believability produced by acceptance may be specific to negative self-referent thoughts, when compared to positive thoughts. Healy et al (2008) suggest that this may demonstrate that defusion may be more impactful on psychological content that is likely to be the focus of experiential avoidance, consistent with the Psychological Flexibility Model. Kohl, Rief & Glombiewski (2012) suggest that reducing believability of private experiences may be an effect specific to acceptance, as cognitive defusion is not a target of other emotion regulation strategies. However, in comparisons with distraction conditions there have been mixed results, with McMullen et al. (2008) and Masuda et al. (2010) reporting lower believability associated with acceptance, while other studies have shown equivalence between acceptance and distraction (Broderick, 2005; Kuehner, Huffziger & Liebsch, 2009; Najmi, Riemann & Wegner, 2009). A potential explanation for these results is that distraction may produce similar effects on believability to acceptance; in other words as an effective regulation strategy distraction may work to reduce the influence of internal experiences as the participant focuses on other stimuli. At present it is unknown what the effects of reappraisal are upon believability, as this comparison has not been reported in a published study

4.9.8 Regulation strategies and psychosis: experimental studies

Perry et al. (2012) compared participants with schizophrenia and non-clinical controls trained in the use of reappraisal, acceptance and suppression, using video clips eliciting negative affect

(sadness). Subjective experience and behavioural expression of emotion, along with willingness (to watch further video clips) were used as outcomes for the experiment; instructions for emotion regulation strategies were delivered using audiotape, with a standardised length and complexity (no metaphors or experiential delivery). It was found that both groups (schizophrenia and non-clinical) displayed equivalent levels of sadness and general negative affect, during and after the mood induction: the acceptance condition appeared to amplify the magnitude of negative experiences in the short-term, but with no lasting difference compared to the other conditions in the longer term; the reappraisal condition resulted in the lowest level of negative affect throughout the experiment. Participants with schizophrenia did exhibit greater behavioural expression of emotion (measured by brow activity) in response to the video clips, while their reported levels of affect were similar to the non-clinical group. The main difference between the two groups was that the participants with schizophrenia were less willing to watch another sadness-inducing video clip; in contrast, non-clinical participants in the acceptance condition displayed significantly greater willingness to watch another video. Perry et al (2012) report that the superiority of acceptance for greater willingness to experience difficult affect was only found in the non-clinical group, and that this result may reflect the general experiential avoidance associated with schizophrenia (Perry et al., 2011), that may not be influenced by a brief acceptance instruction.

4.10 Summary & Discussion

This review suggests that there are comparative differences in the effects of acceptance, reappraisal, and suppression on the regulation of private experiences. Acceptance may be an effective strategy for increasing willingness and persistence in the face of a negative experience, but may involve increased intensity of the experience, at least in the short-term. It also appears to reduce the influence that negative experiences have upon subsequent behaviour (a cognitive defusion effect), which may be a unique effect to acceptance. Reappraisal appears to be advantageous for limiting the intensity of an aversive experience, and may possibly produce greater task persistence. In comparison to both reappraisal and acceptance, suppression, while being effective in reducing outward display of emotion, appears to be a highly maladaptive

strategy in terms of the intensity of negative experience, tolerance and willingness to persist in a challenging situation, and increased experience of unwanted thoughts: it may be that suppression amplifies increased contact with private experiences.

In terms of the emotion regulation framework, reappraisal is considered to be an antecedent-focused strategy, and certainly is advantageous over the response-focused strategy of suppression; acceptance appears to have features of both antecedent- and response-focused strategies, i.e. not involving direct change of emotion itself, but rather on influencing behaviour in response to emotion.

The most problematic limitation of the experimental literature reviewed above is that it may not be generalizable to clinical contexts. For instance, reappraisal has been operationalized within the experimental literature as an antecedent strategy, while in clinical practice and through learning it may be more an "on-line", response-focused strategy, with potentially diminishing returns in distress reduction the later it is used after emotion is evoked (see Sheppes & Meiran, 2007 for a discussion).

Chapter 5

Study 1 - Correlates of naturally-occurring psychological flexibility and mindfulness with distressed voice hearers

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5.1 Abstract

The psychological flexibility model has been hypothesised as a trans-diagnostic, process-oriented approach to understanding various clinical disorders and problems, including chronic pain, anxiety and substance misuse. In this study we investigated the model's applicability to the experience of hearing distressing voices, exploring the relationships that psychological flexibility and non-judgemental acceptance have with distress, disability, and behavioural responses to voice hearing, with a sample of people experiencing persisting auditory hallucinations. We predicted that psychological flexibility, mindful action and non-judgemental acceptance would be negatively associated with distress, disability and behavioural responses to voice hearing. In addition we predicted that psychological flexibility and mindfulness would have increased explanatory power over and above appraisal and thought control strategies. A cross-sectional design was used; fifty participants experiencing persisting auditory hallucinations completed a number of scales assessing depression, anxiety, beliefs about voices, thought control strategies, severity of auditory hallucinations, as well as psychological flexibility and mindfulness. Psychological flexibility and non-judgemental acceptance were found to account for a significant proportion of the variance in regression-based models of depression and anxiety, as well as emotional and behavioural resistance to voices, beyond the models predicted by appraisals of voices and use of thought control strategies alone. However, this was not found for distress associated with voice hearing, life disruption and engagement with voices. The study results suggest that psychological flexibility and non-judgemental acceptance are related to general emotional well-being, rather than specific dimensions of, voice hearing.

5.2 Introduction

Psychological flexibility models and treatments have shown promise in understanding maintenance factors and helping those who are impacted by a variety of problems (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). As discussed in Chapter 2, there may also be potential for psychological flexibility models to inform our understanding of distress and disability with psychotic symptoms. Psychological treatments that focus on reducing experiential avoidance are showing emerging effectiveness in helping individuals overcome their difficulties (Hayes et al., 1999; Hayes et al., 2006). One of the ways that psychological flexibility is developed is through mindfulness (Hayes et al, 2006; Linehan, 1993), a set of skills that involves learning to become aware of the processes of thinking (such as taking thoughts as literal truth or "cognitive fusion", described by Hayes et al.), and relating differently to these processes by developing a de-centred/"de-fused" stance toward the content of thoughts, emotions and other private experiences (Teasdale et al., 2002). It is theorised that this de-centred stance toward private experiences reduces experiential avoidance and encourages greater persistence and flexibility in actions toward valued life directions (Hayes et al., 2004). Mindfulness and acceptance techniques target the *relationship* that a person has with their internal experiences (Pérez-Álvarez et al., 2008), and cultivate alternate influences over behaviour by allowing the individual to have greater capacity to respond pro-actively rather than reactively (by chosen, value-based behaviours, as described by Hayes et al., 1999).

As discussed in Chapter 1, there are indications that acceptance of voices may play a role in better functioning and less distress in voice-hearers (e.g., Farhall and Gehrke, 1997). As discussed in Chapter 3, Gaudiano and Herbert (2006) found that encouraging non-judgemental acceptance of voices mediated outcomes for distress of those experiencing voices. Non-judgemental acceptance also encompasses the relationship that a person has with appraisals, responding to automatic evaluations from a dispassionate stance (Baer et al., 2004), and resulting in fewer efforts to engage in control of thoughts (Baer et al., 2006). The polar opposite of psychological flexibility and non-judgemental acceptance, experiential avoidance (EA), is implicated in clinical models of distress with psychosis (e.g., Chadwick, 2006), and there have been a small set of studies that have explored this relationship (Shawyer et al., 2007; Udachina, 2009).

5.2.1 Measures of acceptance and non-judgemental acceptance

Acceptance/experiential avoidance and non-judgemental acceptance have typically been measured by the use of self-report measures (see Chapter 2, section 2.4.1.2). In the Acceptance and Commitment Therapy (ACT) literature EA has been measured by the Acceptance and Action Questionnaire (AAQ version1: Hayes, Strosahl et al., 2004; version 2: Bond et al., 2011) across various populations, although not so far with psychosis. A measure of non-judgemental acceptance of mental experience is the "acceptance without judgement" sub-scale of the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith & Allen, 2004).

In summary, recent trans-diagnostic models consider the effects of EA and non-acceptance as contributing to the maintenance of psychological problems (Hayes et al., 1996; Hayes et al., 2006; (Hayes, Levin, Plumb-Vilardaga, Villatte, & Pistorello, 2011) . There has been limited attention to these constructs within cognitive models of psychosis although there is preliminary evidence from treatment studies to suggest that developing non-judgemental acceptance of voices can be helpful (Bach & Hayes, 2002; Gaudiano & Herbert, 2006a). The present study explored the relationships between acceptance, mindful action, and non-judgemental acceptance, and predictors of distress and disability in auditory hallucinations, such as appraisals of voices as malevolent, benevolent and omnipotent (Chadwick, Lees & Birchwood, 2000; Favrod et al., 2004), as well as the use thought control strategies, such as punishment and worry (Garcia-Montes et al., 2006; Morrison, 2001; Morrison & Wells, 2000). This study explored the incremental explanatory power of adding acceptance constructs to cognitive models of distress with voice hearing.

5.2.2 Research questions and Hypotheses

The two study questions were:

1] What relationships are there between psychological flexibility, non-judgemental acceptance, appraisals of voices, coping strategies and voice distress and disability?

It was predicted that psychological flexibility, mindful action, and non-judgemental acceptance would be negatively correlated with appraisals of voice malevolence and power, resistance to voices, use of thought control strategies, and voice-related distress and disruption, as well as depressive and anxiety symptoms.

2] Do psychological flexibility, mindful action, and non-judgemental acceptance result in additional predictive power for a range of dependent variables (anxiety and depression symptoms, distress and disability associated with voice hearing, emotions and efforts to resist/engage with voices), when included with variables from cognitive models (such as appraisals of malevolence and benevolence, along with thought control strategies)?

It was predicted that appraisals of voices, as well as use of thought control strategies, would significantly account for the variance of the dependent variables.

It was predicted that a significant amount of variance would then be additionally explained by the inclusion of psychological flexibility and non-judgemental acceptance in models of voice hearing.

5.2.2.1 Selecting Independent/ Dependent variables

Two sets of independent variables (IVs) were selected for the study, in order to investigate the relative contributions of variables from two differing models (a cognitive model of auditory hallucinations, and the Psychological Flexibility Model). The first set of independent variables were based on the cognitive models of voice-hearing distress and disability: appraisals of voice omnipotence and of voice's intentions to harm or help (malevolence and benevolence), and levels of use of thought control strategies. The second set of IVs included acceptance and mindfulness: levels of psychological flexibility, mindful action, and non-judgemental acceptance.

The dependent variables (DVs) for the study included anxiety and depression symptoms, distress and disability associated with voice hearing, and emotional responses and behavioural efforts to resist/engage with voices.

5.3 Method

5.3.1 Ethical Considerations

This study received ethical approval in July 2006 from the Joint South London and Maudsley and The Institute of Psychiatry NHS Research Ethics Committee (REC reference 066/04). Research & Development approval was obtained from the South London & Maudsley NHS Foundation Trust (see Appendix A-1 for relevant documentation).

5.3.2 Design

The study used a cross-sectional design, exploring the relationships between non-judgemental acceptance and psychological flexibility variables, and a number of dimensions of voice hearing. These relationships were investigated using a symptom-focused, rather than diagnostic approach, with regard to the inclusion of participants in the study (e.g., Bentall, 1990 and as discussed in Chapter 1).

5.3.3 Participants & Procedure

5.3.3.1 Participants

Participants met the following inclusion criteria: diagnosed with a psychotic illness according to ICD-10 criteria (F20-29; or F32.3 Severe Depressive Episode with Psychotic Symptoms), experiencing persisting auditory hallucinations for at least 3 months, and on a stable medication regime (if they were taking medication). Exclusion criteria were those with a history of organic illness or primary diagnosis of substance misuse.

Voice hearers (N=50) were recruited from mental health services in an inner London borough (South London and Maudsley NHS Foundation Trust (SLaM)). Their mean age was 31.8 (SD = 10.54; range 18-56) years, 66% were male. Chart diagnoses (ICD-10) for the sample were the following: 90% F20-F29 “schizophrenia spectrum”, 10% F32.3 Severe Depressive Episode with Psychotic

Symptoms. In terms of treatment, 94% of the sample were currently prescribed anti-psychotic medication, 6% of the sample were not on any form of psychotropic medication. Participants described hearing voices for a mean time of 9 years (range 3 months – 33 years). Consistent with other samples of service users from UK inner city localities, the sample was ethnically diverse (with 36% White British or other white background, 44% Black British/African/Caribbean, 8% mixed race, 6% British Asian/Asian, and 6% from other background or unstated). The majority were unemployed (74%; student 14%, employed part-time 6%, employed full time 6%). Seventy percent of the participants were recruited from community teams, while 30% were inpatients on voluntary admissions (at the time of interview).

5.3.3.2 Procedure

Participants were recruited from service users who attend community mental health clinics or were voluntarily admitted to psychiatric wards. Participants were approached for their consent to take part in the study, and the measures were administered in one sitting.

5.3.4 Measures

Acceptance & Action Questionnaire (AAQ-II; Bond et al, 2011 See Appendix A-2.1) – This 7-item questionnaire is designed to be a measure of experiential avoidance/psychological flexibility. Respondents rate the degree to which each statement applies to them on a Likert scale (1 - never true to 7 - always true); scale range 7-49. High scores on the AAQ-II suggest greater acceptance of mental experiences and persistence with life goals in the face of these experiences. The AAQ-II has good internal reliability, reported at .84 (Bond et al., 2011).

Beliefs about Voices Questionnaire Revised (BAVQ-R; Chadwick, Lees & Birchwood, 2000; See Appendix A-2.2) – This 35-item questionnaire is designed to measure attributions, beliefs, emotional responses and behaviour about voices. Respondents rate the degree to which each item describes the way they have been feeling in the past week on a 4-point Likert scale ("Disagree" to "Strongly Agree"). The sub-scales for the BAVQ-R have been demonstrated to have adequate internal consistency (Cronbach's alpha for each sub-scale 0.74-0.88; Chadwick, Lees &

Birchwood, 2000). The sub-scales for the BAVQ-R are made up of three sub-scales of appraisals (malevolence, benevolence, omnipotence), and two sub-scales of emotional and behavioural responses (resistance and engagement). Scales range between: 0-18 for malevolence, benevolence, and omnipotence; 0-27 for resistance, and 0-24 for engagement.

For the purposes of this study the behavioural and emotional responses items were examined separately, in order to investigate the relationship of psychological flexibility and non-judgemental acceptance on volitional responses (behaviours), as compared to non-volitional responding (emotions). Therefore to measure behaviours related to resistance and engagement with voices on the BAVQ-R, the totals of these items were calculated using only the items that described behaviours (e.g., on the Resistance sub-scale, "I do things to prevent it talking"), rather than also including the affect items (e.g., "My voice makes me feel down"). There are four emotional response items in the Engagement sub-scale (out of eight total) and four emotion items in the Resistance sub-scale (out of nine total). Therefore the behavioural resistance to voices scale range was 0-12, and the behavioural engagement with voices scale range was 0-15.

Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith & Allen, 2004; See Appendix A-2.3): This is a 39-item scale designed to measure behaviours associated with mindfulness. Sub-scales of KIMS include skills of Observing, Acting with Awareness (taking mindful action, with undivided attention), Accepting without Judgement (non-judgemental acceptance), and Describing, with high scores indicating greater use of mindfulness in daily life. The internal consistency of the KIMS appears to be good with the alpha coefficients of the sub-scales scoring between .83 and .91.

Previous studies investigating the relationship between mindfulness and experiential avoidance (measured by the original AAQ; Hayes et al., 2004) suggest moderate but significant ($p<.001$) correlations with the Describe (-.35), Acting With Awareness (-.30) and Accept Without Judgement (-.26) sub-scales of the measure (using non-psychotic samples) (Baer, Smith & Allen, 2004). For the purpose of hypothesis testing in this study, we used only the Act with Awareness and Acceptance Without Judgement sub-scales. Scale scores range between: 12 – 60 for Observe, 8 – 40 for Describe, 10 – 50 for Acting With Awareness, and 9 – 45 for Accept Without Judgement.

Beck Depression Inventory–II (Beck, Steer & Brown, 1996; See Appendix A-2.4) - This is a 21-item questionnaire designed to measure severity of depressive symptoms; BDI-II scores range between 0 – 63, with high scores indicating more severe depressive symptoms. It has high reported reliability (Coefficient Alpha = .92. Previous correlations with the AAQ-II have been .71, in non-psychosis samples (Bond et al., 2011).

Beck Anxiety Inventory (Beck & Steer, 1990; See Appendix A-2.5) – This is a 21-item questionnaire designed to measure severity of anxiety symptoms; the scale ranges between 0 – 63, with high scores indicating more severe anxiety symptoms. It has high reported internal consistency (Cronbach's alpha .92- .94). Previous reported correlations with the AAQ-II have been .61, in non-psychosis samples (Bond et al., 2011).

Thought Control Questionnaire (Wells & Davies, 1994; See Appendix A-2.6) – This is a 30-item instrument designed to measure individual differences in strategies used to try and control unwanted distressing thoughts. All items are scored 1 (never) to 4 (almost always); total scores range from 30 – 120; all subscales range 6-24: high scores suggest frequent use of thought strategies. The TCQ measures five factors that correspond to different strategies for controlling unwanted thoughts: Distraction; Social Control; Worry; Punishment; and Re-appraisal. The TCQ has acceptable psychometric properties, with reported Cronbach Alpha scores for the sub-scales reported between 0.64 to .79, and test-retest reliability (six weeks) ranging from .67 to .83 for the sub-scales and .83 for the total score. Previous sub-scale correlations with the AAQ have been moderate: Punishment (.37) and Worry (.36) (Hayes et al., 2004).

Psychotic Symptom Rating Scales (PSYRATS) – Auditory Hallucinations sub-scale (Haddock, McCarron, Tarrier & Faragher, 1999; See Appendix A-2.7) – This is an interview-rated scale measuring various dimensions of auditory hallucinations, with 11 subscale items for: frequency, duration, location, loudness, disruption; amount and intensity of distress; beliefs about the origin of voices; amount and degree of negative content; and controllability. The PSYRATS has been found to have high inter-rater reliability and was designed to be sensitive to changes following psychological intervention with psychosis (Haddock et al., 1999). Scores for each subscale range 0 – 4, with a total score range of 0 – 44. In this study these subscales were used as dependent variables: distress amount, and disruption.

5.3.5 Data Analytic Plan

Statistical analyses were conducted using SPSS version 18.0 for Windows. Preliminary analyses of the data distribution were performed: this showed that several variables were not normally distributed – PSYRATS Distress Amount and Disruption, and BAVQ-R Malevolence, Benevolence, Behavioural/ Emotional Resistance, and Engagement.

Correlations were calculated to test the hypotheses regarding relationships between variables (using Pearson's correlations for normally-distributed variables, and Spearman's rho for the others), and to clarify the independent variables to be included in the hierarchical regression analyses. Hierarchical regression analyses were then conducted to test whether significant increases in explained variance resulted from including psychological flexibility, mindful action, and non-judgemental acceptance in combination with predictors from cognitive models. For the non-normally distributed dependent variables of PSYRATS Distress Amount, Disruption, BAVQ-R Behavioural Resistance logistic regressions (Forward Wald) were conducted.

5.4 Results

The results are reported in several sections:

1. descriptive statistics of study variables
2. internal consistency of the mindfulness and acceptance scales
3. correlations between variables
4. regression analyses to test the study hypotheses.

5.4.1 Descriptive statistics

Means, standard deviations (SDs) and ranges of scores obtained on all the measures are presented in Table 5.1.

Table 5.1 Descriptive statistics for Study 1 measures, including mean, standard deviation and range of scores

	N	Mean	SD	Minimum	Maximum
Auditory Hallucinations sub-scale (PSYRATS)	50	29.7	4.7	17.00	39.00
Beck Depression Inventory-II	50	2.4	11.9	0	52.00
Beck Anxiety Inventory	50	23.4	13.8	3.00	55.00
Acceptance and Action Questionnaire-II	50	24.00	10.00	7.00	47.00
Kentucky Inventory of Mindfulness Skills					
Observe	48	38.5	10.5	16.00	58.00
Describe	47	25.4	5.0	16.00	36.00
Act with Awareness	48	30.5	5.6	17.00	50.00
Accept without Judgement	48	24.8	8.0	11.00	45.00
Thought Control Questionnaire					
Social Control	49	12.7	2.5	8.00	19.00
Re-appraisal	49	14.4	3.5	6.00	20.00
Worry	48	12.0	3.6	6.00	22.00
Distraction	48	14.4	3.7	8.00	23.00
Punishment	49	12.4	3.5	6.00	20.00
Beliefs About Voices Questionnaire-Revised					
Voice malevolence	50	9.6	4.1	0	17.00
Voice benevolence	50	4.3	4.6	0	16.00
Voice omnipotence	50	10.4	3.8	0	17.00
Behavioural Resistance to voice	50	10.4	3.9	2.00	15.00
Behavioural Engagement with voice	50	2.5	2.6	0	10.00
Emotional Resistance to voice	49	8.6	3.1	0	12
Emotional Engagement with voice	50	3.0	3.3	0	12

5.4.1.1 Comparisons with voice hearing /psychosis samples from published research

This sample showed equivalent levels of symptomatology to previous samples of voice hearers in the clinical literature, with reference to mean scores on BDI, BAI and PSYRATS (Gilbert et al., 2001, Haddock, McCarron, Tarrier, & Faragher, 1999, Peters et al., 2012). They appeared to be more experientially avoidant on the AAQ-II than a student sample (Bond et al, 2011), with similar scores to psychosis samples on the AAQ-II (Valiente, Provencio, Espinosa, Chaves, & Fuentenebro, 2011) and on the KIMS acting with awareness and non-judgemental acceptance to both psychosis (White et al., 2011) and other clinical samples (Baum et al., 2010). In terms of use of thought control strategies there were similar levels reported to a psychosis sample (Morrison & Wells, 2000), although there was a greater use of reappraisal reported in this study sample. Scores on the BAVQ-R were equivalent to the voice hearing samples reported by Chadwick, Lees and Birchwood (2000) and Peters et al. (2012).

5.4.2 Internal consistency of the AAQ-II, the KIMS- Accept without Judgement and the Acting with Awareness sub-scales

Both the AAQ-II and the Accept without Judgement sub-scale (KIMS) demonstrated good internal consistency, with Cronbach's alphas of 0.83 and .85 respectively.

The Acting with Awareness (KIMS) sub-scale demonstrated poor internal consistency with a Cronbach's alpha of .59. As a result of this poor internal consistency the Acting with Awareness subscale was dropped from subsequent regression analyses.

5.4.3 Correlations with voice hearing dimensions

Related to Question (1) (relationships between psychological flexibility, mindful action, non-judgemental acceptance, appraisals of voices, coping strategies and voice distress and disability), Pearson's and Spearman's rho correlations between the measures used are given in Table 5.2.

Table 5.2 Inter-correlations among study variables – Pearson's (Spearman's indicated by italics)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Beck Depression Inventory-II	-																	
2. Beck Anxiety Inventory	.52***	-																
3. Voice – Distress Amount (PSYRATS)	*.17*	*.01*	-															
4. Disruption from Voices (PSYRATS)	.23	*.07*	*.24*	-														
5. Behavioural Resistance to voice (BAVQ-R)	*.25*	.24	*.28*	*.14*	-													
6. Behavioural Engagement with voice (BAVQ-R)	*-.17*	-.13	*-.17*	*.14*	*-.16*	-												
7. Emotional Resistance to voice (BAVQ-R)	*.40***	*.24*	*.18*	*.01*	*.46****	*-.11*	-											
8. Emotional Engagement with voice (BAVQ-R)	*-.23*	*.01*	*-.29**	*.22*	*-.09*	*.66*	*-.12*	-										
9. BAVQ-R: Omnipotence	.35*	.11	*-.01*	*.33**	*.28**	*.23*	*.45****	*.22*	-									
10. BAVQ-R: Malevolence	*.31**	*-.01*	*.41***	*.22*	*.38***	*-.22*	*.39***	*-.36***	.28	-								
11. BAVQ-R: Benevolence	*-.08*	*.05*	*-.35**	*.08*	*-.04*	*.56****	*.23*	*.60****	.31*	-.30*	-							
12. TCQ: Punishment	.40**	.46***	*.03*	*.13*	*.34**	*.14*	*.31**	*.15*	.36*	.06	.07	-						
13. TCQ: Social Control	.24	.45***	.06	.08	*.07*	*.09*	*.14*	*-.01*	.18	-.14	-.02	.38**	-					
14. TCQ: Worry	.12	.24	.01	.15	*.02*	*.25*	.28	*.28*	.18	.17	.02	.42**	.26	-				
15. TCQ: Distraction	*-.34**	*-.21*	*.08*	*-.04*	*.06*	*-.01*	*-.05*	*.09*	*-.06*	*.05*	*.01*	*-.05*	*.12*	*.23*	-			
16. TCQ: Reappraisal	-.09	.17	-.18	-.06	*.24*	*.30**	*.06*	*.30**	.19	.20	.33*	.40**	.33*	.31*	.51***	-		
17. KIMS: Acting with Awareness	-.51***	-.47***	*-.01*	.07	*-.03*	*.30**	*-.35**	*.27*	-.07	-.06	.22	-.26	-.07	.05	.14	.04	-	
18. KIMS: Accept without Judgement	-.40**	-.38**	*.14*	*.11*	*-.42***	*-.04*	*-.48****	*-.03*	-.41**	.28	-.04	-.59***	-.25	-.27	.04	-.44**	.36*	-
19. AAQ-II	-.66***	-.57***	*-.16*	*-.15*	*-.37***	*.04*	*-.28**	*.06*	-.34*	-.12	-.06	-.38**	-.21	-.10	.15	-.06	.41**	.52***

*** Correlation significant at the 0.001 level (2-tailed)

** Correlation significant at the 0.01 level (2-tailed) * Correlation significant at the 0.05 level

5.4.3.1 Relationships of psychological flexibility and mindfulness with dependent/independent variables

The AAQ-II (psychological flexibility) was significantly inversely correlated with depressive ($p < .001$) and anxiety ($p < .001$) symptoms, and emotional ($p < .05$) and behavioural ($p < .01$) resistance to voices. Similarly The KIMS Accept without Judgement sub-scale had significant negative correlations with depressive and anxiety symptoms (both $p < .01$), as well as emotional ($p < .001$) and behavioural resistance to voices ($p < .01$). Finally, the KIMS Acting with Awareness subscale had significant negative correlations with depression and anxiety symptoms (both $p < .01$), as well as behavioural resistance with voices ($p < .05$). There was a significant positive relationship with behavioural engagement with voices ($p < .05$).

However, contrary to the study predictions, neither the AAQ-II nor the KIMS scales werenegatively correlated with the PSYRATS amount of distress from the voices, or disruption caused by voices. In addition, apart from the KIMS Acting with Awareness subscale, there were no significant relationships found with emotional or behavioural engagement with voices.

There were significant relationships found between appraisals of voice power (omnipotence) psychological flexibility and mindfulness: both the AAQ-II ($p < .05$) and KIMS Accept without Judgement ($p < .01$) were negatively associated with omnipotence appraisals, while KIMS acting with awareness was not. There were no significant relationships found between psychological flexibility/ mindfulness and appraisals of voice intentions (malevolence, benevolence).

In terms of thought control strategies, psychological flexibility and non-judgemental acceptance demonstrated only specific relationships, rather than the expected associations with the range of thought control strategies. Thus, psychological flexibility (AAQ-II) was negatively associated with the use of punishment ($p < .01$) only, while KIMS non-judgemental acceptance was negatively correlated with the use of punishment ($p < .001$) and reappraisal ($p < .01$). KIMS acting with awareness did not show any significant relationships with thought control strategies.

5.4.3.2 Relationships of dependent variables with appraisals and thought control strategies

As can be seen from Table 5.2 there were significant positive associations for depressive symptoms (BDI-II) and BAVQ-R appraisals of voice omnipotence ($p < .05$) and malevolence ($p < .05$), as well as with the use of thought control strategies (TCQ): a positive association with the use of punishment ($p < .01$), and a negative relationship with the use of distraction ($p < .05$). It was also found that anxiety symptoms (BAI) demonstrated highly significant positive associations with efforts to control thoughts using punishment, as well as social control (both at $p < .001$); there were no significant associations between anxiety and voice appraisals.

There were a smaller number of significant associations for the PSYRATS amount of distress caused by voices, with a positive correlation with malevolence appraisals ($p < .01$) and a negative association with appraisals of voice benevolence ($p < .05$); there was no significant association with appraisals of voice omnipotence, or the use of thought control strategies.

The PSYRATS disruption subscale demonstrated only one significant relationship, with appraisals of voice omnipotence ($p < .05$).

The two Engagement variables showed similar associations: Behavioural Engagement had significant positive associations with appraisals of voice benevolence ($p < .001$) and use of reappraisal thought control ($p < .05$); Emotional Engagement was positively associated with benevolence ($p < .001$), use of reappraisal thought control ($p < .05$), as well as negatively associated with appraisals of voice malevolence ($p < .01$).

Finally, for emotional and behavioural resistance to voices there were similar associations: both demonstrated significant positive relationships with appraisals of voice omnipotence (behavioural resistance: $p < .05$; emotional resistance: $p < .001$) and malevolence ($p < .01$ for both), as well as use of punishment thought control ($p < .05$ for both).

5.4.4 Regression analyses

As an initial step in to prepare for the regression analyses multi-collinearity of the IVs was tested by running collinearity statistics and diagnostics as part of the regression analyses on SPSS (see Table 5.3 below); the Tolerance and Variance Inflation Factors (VIFs) for all variables do not suggest multi-collinearity.

Table 5.3 Collinearity statistics for Independent Variables

Independent Variable	Collinearity Statistics	
	Tolerance	Variance Inflation Factor
KIMS: Acceptance without Judgement	.371	2.699
AAQ-II	.628	1.592
BAVQ-R: Omnipotence	.492	2.034
BAVQ-R: Malevolence	.548	1.825
BAVQ-R: Benevolence	.523	1.911
TCQ: Punishment	.542	1.846
TCQ: Distraction	.583	1.716
TCQ: Social Control	.758	1.319
TCQ: Reappraisal	.353	2.831

In order to address question (2), related to the incremental validity of psychological flexibility and non-judgemental acceptance, hierarchical regression analyses were conducted to assess the variance accounted for on the dependent variables of depressive symptoms (BDI-II), and anxiety symptoms (BAI).

These regressions involved including in Step 1 predictors based on cognitive models for auditory hallucinations, and then adding in Step 2 psychological flexibility and non-judgemental acceptance. Independent variables were only selected for Step 1 if they correlated significantly with the dependent variables (these variables are shown in Table 5.2 and described in the correlation section above).

In addition, Forward Wald analyses were conducted for behavioural resistance (BAVQ-R), voice-related distress (PSYRATS), and disruption (PSYRATS); this involved entering stepwise the significant cognitive independent variables (again described above in the correlations section) in Step 1, and then in Step 2 psychological flexibility and non-judgemental acceptance. In order to conduct these analyses we created dichotomous variables using a median split for behavioural resistance, behavioural engagement, emotional resistance, emotional engagement, voice related distress and disruption. For behavioural resistance scores of 10 or below were classed as “low resistance” (46% of sample), with 10 and above “high resistance” (54% sample). Behavioural engagement scores of < 3 were classed as “low engagement” (52% of sample), with scores 3 and above classed as “high engagement” (48% sample). Emotional resistance was classed as “low” for scores < 10 (53% of sample), with “high emotional resistance” for 10 and above (47% of sample). Emotional engagement scores were classed as

"low" if <3 (54% of sample), or high if 3 or greater (46% of sample). Similarly, scores 0-2 for PSYRATS Distress Amount were classed as "low distress" (28% of sample), with 3-4 "high distress" (72% of sample). Finally PSYRATS Disruption scores 0-2 were classed as "low disruption" (68% of sample), with 3-4 "high disruption" (32% of sample).[1]

[1] Due to the skewed distribution of the PSYRATS subscales scores the median splits did not divide the sample evenly

Table 5.4 shows the regression analyses for the dependent variables of Depressive Symptoms and Anxiety Symptoms

Table 5.4 Hierarchical multiple regression analysis of study dependent variables

				Change Statistics				
Dependent Variable	**Model**	**Adjusted R^2**	**Standard error of estimate**	**R^2 Change**	**F Change**	**df1**	**df2**	**Significant F change**
Depression	1	.26	10.352	.33	5.216	4	43	.01
	2	.44	9.039	.18	7.698	2	41	<.001
Anxiety	1	.25	12.096	.28	8.636	2	45	.001
	2	.45	10.842	.17	6.506	2	43	.003

* p < .05
** p < .01
*** p < .001

Depression

Step 1 – punishment thought control (B = 1.113, ß =.32*), distraction thought control (B = -1.010, ß =-.31*), omnipotence (B = .444, ß =.14); malevolence (B = .707, ß =.24)

Step 2 - punishment thought control (B = .526, ß =.15), distraction thought control (B = -.959, ß =-.30*), omnipotence (B = .082, ß =.03), malevolence (B = -.665, ß = .23), psychological flexibility (B = -.714, ß = -.44**), acceptance without judgement (B = -.125, ß = -.08)

Anxiety

Step 1 – punishment thought control (B = .550, ß = .33*), social control thought control (B = .753, ß = .31*)

Step 2 – punishment thought control (B = .923, ß =.23), social control thought control (B = 1.486, ß = .27*), psychological flexibility (B = -.650, ß = -.47***), acceptance without judgement (B = .141, ß =.08)

Table 5.5 shows the logistic regression analyses for Behavioural Resistance/ Engagement to Voices, Emotional Resistance / Engagement, Voice Distress, and Disruption due to voice hearing.

Table 5.5 Forward Wald logistic regressions for dependent variables

Dependent Variable	Model	Equation X^2	df	Sig	Class High %	Class. Low %	Overall Class. %	Improvement X^2	df	Sig.
Behavioural Resistance to Voices	1	5.364	1	.02	81.5	47.6	66.7			
	2	11.150	2	.004	77.8	52.4	66.7	5.786	1	.02
Behavioural Engagement with Voices	1	15.281	1	<.001	60.9	88.0	75.0			
	2	15.281	1	<.001	60.9	88.0	75.0	-	-	-
Emotional Resistance to Voices	1	14.794	2	.001	72.7	84.6	79.2			
	2	20.788	3	<.001	77.3	92.3	85.4	5.994	1	.02
Emotional Engagement with Voices	1	21.193	1	<.001	72.7	96.2	85.4			
	2	21.193	1	<.001	72.7	96.2	85.4	-	-	-
Voices – Distress Amount	1	10.114	1	.001	35.7	91.2	75.0			
	2	10.114	1	.001	35.7	91.2	75.0	-	-	-
Disruption	1	7.893	1	.005	87.5	31.3	68.8			
	2	7.893	1	.005	87.5	31.3	68.8	-	-	-

Behavioural Resistance to voices

Step 1 – omnipotence (B=.19, Wald=4.63, p <.05); not included: malevolence, punishment thought control

Step 2 – omnipotence (B=.13, Wald=1.20, n.s.), acceptance without judgement (B=-.11, Wald, 4.83, p <.05); not included: psychological flexibility

Behavioural Engagement with voices

Step 1 – benevolence (B=.32, Wald= 9.038, p <.01); not included: reappraisal thought control.

Step 2 – no further variables included (psychological flexibility, acceptance without judgement)

Emotional resistance to voices

Step 1 – malevolence (B=.28, Wald= 6.674, p <.01), punishment thought control (B=.23, Wald=4.20, p <.05); not included: omnipotence

Step 2 - malevolence (B=.33, Wald= 7.605, p <.01), punishment thought control (B=.04,

Wald=0.09, n.s); acceptance without judgement (B= -1.54, Wald= 4.529, p <.05), not included: psychological flexibility

Emotional Engagement with voices

Step 1 – benevolence (B=.43, Wald=10.532, p < .001); not included: malevolence, reappraisal thought control

Step 2 - no further variables included (psychological flexibility, acceptance without judgement)

Voices Distress – Amount

Step 1 – malevolence (B=.27, Wald=7.97, p < .01); not included: benevolence.

Step 2 – no further variables included (psychological flexibility, acceptance without judgement)

Disruption from voices

Step 1 – omnipotence (B=.26, Wald=6.36, p <.05)

Step 2 - no further variables included (psychological flexibility, acceptance without judgement).

5.4.5 Summary of Results

In this sample of distressed voice hearers we found significant, negative associations between psychological flexibility and non-judgemental acceptance and appraisals of omnipotence, use of punishment thought control, level of depressive and anxiety symptoms, and actions and emotions focused on resisting the voices. Non-judgemental acceptance was also found to be negatively associated with the use of reappraisal as a thought control strategy. However, there were no relationship between psychological flexibility/non-judgemental acceptance and distress and disruption from voices, or with emotional and behavioural engagement with voices.

Using hierarchical and logistic regression analyses we found that models that incorporated psychological flexibility and non-judgemental acceptance, along with predictors based on cognitive models of distressed voice hearing (appraisals of voices intentionality and power, thought control strategies), resulted in a greater proportion of the variance explained for depressive and anxiety symptoms, and for behavioural and emotional resistance to voices. As would be expected from the pattern of correlations, models of distress associated with voice

hearing, life disruption and the emotions and actions of engaging with voices did not benefit from the inclusion of psychological flexibility and non-judgemental acceptance.

Finally, there were differential contributions between the measures of acceptance: the KIMS Acceptance without Judgement contributed to the prediction of behavioural and emotional resistance to voices, while the AAQ-II contributed to the prediction of depressive and anxiety symptoms.

5.5 Discussion

The results of this study suggest that naturally-occurring skills of psychological flexibility and non-judgemental acceptance, as reported by voice hearers, are related to several important outcomes in voice hearing. The study findings suggest that psychological and non-judgemental acceptance are associated with levels of depressive and anxiety symptoms, as well as emotional and behavioural responses to resist voices. Moreover in regression-based models of these outcomes there were incremental improvements by including psychological flexibility and non-judgemental acceptance, in combination with variables identified in cognitive models (appraisals, thought control methods).

However, while psychological flexibility and non-judgemental acceptance were found to be related to general wellbeing, the study predictions of significant relationships with voice-related distress or life disruption were not supported. For these outcomes appraisals of voice intention (malevolence, in the case of voice-related distress) or power (for disruption) were found to be the only significant independent variables in the regression-based models. These results suggest that psychological flexibility (as measured by the AAQ-II) may have a role in general emotional outcomes for people who hear distressing voices, but not with the processes that result in the amount of distress caused by voices or the disruption associated with this experience. It is possible that a general, population-based measure like the AAQ-II (Bond et al., 2011) does not have the symptom-specificity to adequately measure psychological flexibility for voice hearing; however, subsequent scales that have been developed for auditory hallucinations, such as the Voices Acceptance and Action Scale (VAAS) have also failed to find an association between psychological flexibility and dimensions of voice hearing (Shawyer et al., 2007) , as measured by the PSYRATS.

Consistent with findings in non-psychosis samples, there was a strong negative association between psychological flexibility, as measured by the AAQ-II, and both depression and anxiety (Bond et al., 2011). This is consistent with previous research that has found a strong relationship between experiential avoidance (EA) and depression (Hayes et al., 1996), and to behavioural models of depression that posit a central role for avoidance in maintenance (Ferster, 1973; Martell, Addis & Jacobsen, 2001). Considering previous research has suggested that depression is associated with increased disability and morbidity for distressed voice hearers (Birchwood & Chadwick, 2007; Birchwood, Iqbal & Upthegrove, 2005), the results of this study provide further support for the association between EA and depression in psychosis (White et al., 2012).

Non-judgemental acceptance was found to be negatively associated to efforts to resist voices and emotions related to resistance; this was a similar finding to a study by Chadwick, Barnbrook & Newman-Taylor (2007) that investigated mindfulness and beliefs about voices. The relationship between resistance, non-judgemental acceptance and emotional distress may be complicated: there have been inconsistent findings about whether resistance is positively associated with depression, with significant relationships reported when depression is measured using the BDI (Chadwick, Lees & Birchwood, 2000; Peters et al., 2011); however Shawyer et al. (2007) reported no relationship when depression was measured by the Calgary Depression Scale, a scale to validated with schizophrenia samples. In this study, by dividing the emotional from the behavioural resistance BAVQ-R items, it was found that emotional resistance was significantly associated with depression severity, while behavioural resistance had no association (or indeed with the other dependent variables of anxiety, voice-related distress or disruption). One possible explanation is that the emotional resistance items of the BAVQ-R may reflect general distress, and this may account for the previously-reported high associations with depression, and also for the relationships with non-judgmental acceptance and psychological flexibility in this study. For this sample, the behavioural resistance items may potentially be measuring strategic or functional actions toward voices, and hence are unrelated to negative outcomes, but still negatively associated with non-judgemental acceptance/ psychological flexibility: efforts to resist voices imply a judgemental stance toward these experiences.

Psychological flexibility and, more significantly, non-judgemental acceptance showed negative associations with appraisals of voice omnipotence, while no relationships were found with

appraisals of voice intention (malevolence or benevolence). These findings are similar to the correlations reported by Shawyer et al (2007) using the VAAS. The result suggests that accepting experiences without engaging in judgement is related to a reduced chance of appraising voices as omnipotent. This association fits with the Psychological Flexibility Model, in that believing a voice is omnipotent implies greater cognitive fusion, where experiences are responded to in a literal manner (so that a person may respond to a perceived powerful other in subordinate ways, see Gilbert et al., 2001; Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000); regarding a voice as powerful is antithetical to non-judgemental of experience. Due to the cross-sectional design of this study it is unclear what the direction of causality may be: it is possible that appraising voices as omnipotent increases, in general, judgements about other experiences also. A potential inconsistency with this theoretical perspective is the lack of an association found with appraisals of voice intention (which are also judgements about experience). Chadwick, Barnbrook & Newman-Taylor (2007) report a negative association between a measure of mindfulness of voices and appraisals of malevolence; it may be in the current study that the use of a general measure of non-judgemental acceptance did not adequately assess this relationship, or that beliefs about voice intentions are unrelated to non-judgement/ psychological flexibility. Finally it could be that the construct of mindfulness in the Chadwick, Barnbrook & Newman-Taylor (2007) study is different or has an additional facet to the measures used in this study; an area for further investigation.

Also, contrary to the study predictions, thought control strategies were not related to voice distress or disruption; however, the use of punishment as thought control was positively related to depression, anxiety, appraisals of omnipotence, emotions and actions taken to resist voices. The use of distraction was found to be negatively related to depressive symptoms, and the use of social control (e.g., seeking reassurance) was strongly related to anxiety symptoms. Psychological flexibility and non-judgemental acceptance were related to less use of punishment as a thought control strategy: again, as the direction of causality cannot be determined in this design it may be that the use of punishment to manage unwanted thoughts may increase judgement and non-acceptance of a range of private experiences. Finally, the use of reappraisal to control thoughts was significantly inversely related to non-judgemental acceptance; this could be argued to fit with the conceptualisation of acceptance that reduces the necessity to reappraise experiences to live effectively. The finding that acceptance was

significantly related to emotional outcomes, while the use of reappraisal was not, is in line with this potential explanation.

5.5.1 Limitations of these findings

As described earlier in this discussion, the cross-sectional design of the study limits the conclusions that can be made regarding causality and directionality between the study variables.

This study utilised a sample of distressed voice hearers, and so conclusions cannot be drawn about the relationships of the study variables for people who find voice hearing a pleasant or neutral experience. The sample was skewed toward those with greater levels of life disruption (as measured by the PSYRATS): it was evident when inspecting the data that there were only a small number of participants who engaged with the voices, through action and emotion. Thus, this study may not have been able to explore adequately the relationships of psychological flexibility and non-judgemental acceptance for those who may find their voices engaging and/ or benevolent in nature may nevertheless be disabled by this experience.

There were also several limitations with regard to the measures used in this study. First, analyses of the KIMS Acting with Awareness subscale were curtailed, due to the problems with the internal consistency of the scale. This subscale has been found to have acceptable levels of internal consistency with other samples (Baer, Smith & Allen, 2004), including non-psychosis clinical groups (Baum et al., 2010). A possibility is that the subscale items do not adequately measure this construct in psychosis samples; subsequent studies by Oliver et al. (2011) and White et al. (2011) have found that this subscale does not contribute significantly to study predictions or change significantly following intervention.

Second, it became evident during this study that measures of functioning/disruption need to be more fine-grained to capture the potential costs and benefits of various ways of coping with voices. In this study, measuring disruption associated with voice-hearing on the PSYRATS was unsatisfactory, as the PSYRATS uses a 5 point scale that measures functioning by whether the participant is in supported accommodation or hospitalised. In the study sample a minority of participants scored poorly on this item, resulting in a restricted range of scores (most participants were recruited from community settings and living in independent accommodation). Using an overall score for life disruption has the limitation of obscuring how

voice-hearing may interfere differentially with different life domains (such as concentration/attention, relating to others, self-care, pursuing personal goals). A similar challenge was found with the PSYRATS voice-related distress measure (amount of distress scale): recruiting a sample of distressed voice hearers meant that there was a restricted range of scores (basically the two highest ratings). In retrospect, it may have been better to use an alternate measure that allowed for a greater range of ratings for levels of distress associated with voices, such as the Personal Questionnaire approach used by Peters et al. (2012) or the alternatives to the PSYRATS reviewed by Ratcliff, Farhall & Shawyer (2011).

5.5.2 Clinical Implications

Broadly the results of this study provide evidence that psychological flexibility may be helpful for emotional problems in psychosis, rather than for distress or disruption associated with voices specifically. The study findings suggest that the ability to "step back" from evocative private experiences is associated with voice hearers' experiencing less depression and anxiety, and engaging in fewer efforts to resist voices. In this study, this stance toward experiences was measured as a trait tendency (naturally-occurring) in distressed voice hearers.

An implication of this study is that it may be useful to incorporate psychological flexibility and non-judgemental awareness in clinical models of emotional distress for voice hearers, as potential resilience factors. One advantage of considering these processes in models is that clear intervention strategies are suggested by their inclusion: mindfulness and acceptance, such as featured in the treatment approaches described by Chadwick (2006; Person-based Cognitive Therapy) and Bach and colleagues (Bach et al, 2006; Acceptance and Commitment Therapy). Theoretically, a contextual shift is developed, from a narrow repertoire of avoidance and escape-focused actions that are negatively reinforced and maintain distress, to approach behaviours that potentially result in access to a wider range of reinforcers, both directly contacted and abstractly derived, resulting in greater life meaning and vitality, even with on-going contact with unwanted experiences (Wilson & Murrell, 2004).

Chapter 6

Study 2 - Multiple-baseline evaluation of an acceptance-based intervention for distressing voices

6.1 Abstract

Research exploring the outcome and processes of change in ACT suggest that changes in believability, non-judgemental acceptance and mindfulness are associated with improved well-being, reduced symptom impact, and greater quality of life. In this study the process and outcome of a 10 session ACT intervention for people experiencing distressing and disabling auditory hallucinations was investigated. The study used a multi-baseline, single-case design, with baseline and intervention phases and four assessment points. Outcomes investigated included mood, anxiety, social functioning, quality of life, and severity of auditory hallucinations, which along with process measures (psychological flexibility to voices, non-judgemental acceptance) were assessed using self-report and interviewer-rated scales. A computer-based method of measuring strength of relational responding (implicit belief) was piloted to assess changes in preferences toward acceptance of voices. Eight participants, recruited from community mental health settings and on waiting lists for psychological therapy, completed the intervention and all measures. The results demonstrated that over half of the participants showed some form of improvement following the intervention, while accounting for baseline changes. Significant group improvements in levels of depression, social functioning and quality of life were also found following the intervention, compared to post-baseline. Four participants showed improvement in both well-being and quality of life measures, and some form of change in non-judgemental acceptance, autonomy from voices and/or acceptance toward voices. Assessment of relational responding suggested that those who improved during the ACT intervention may have shown a preference toward acceptance of voices prior to starting therapy. The study had limitations in terms of the heterogeneity within the group, the lack of follow-up to assess the stability or delayed effects of the intervention, and potential issues relating to the difficulties of measuring constructs such as "willingness" (i.e., willingness to have voices as experiences).

6.2 Introduction

In Chapter 3 the literature on outcome research and hypothesised processes of change in Acceptance and Commitment Therapy (ACT) was reviewed, describing intervention studies of a number of (non-psychotic) clinical disorders and problems, and then focusing on the studies carried out with people distressed and/or disabled by psychosis. The conclusions drawn from this research suggest that ACT demonstrates efficacy across a variety of problems, compared to no treatment, and equivalent outcomes to other empirically-based therapies in comparison studies. The literature suggests that, when the underlying ACT processes are investigated, changes in believability and mindfulness appear to mediate outcome (Ruiz, 2012). This has been found in studies following up the outcomes of brief and longer interventions with psychosis (Bach, Hayes & Gallop, 2011; Gaudiano et al., 2012; White et al, 2012), and in particular for those participants experiencing auditory hallucinations (Gaudiano, 2008).

Similarly studies of other mindfulness-based interventions for distressed voice hearers have found that increases in non-judgemental acceptance and reductions in conviction in experiences are related to outcome (Chadwick et al., 2010; Dannahy et al., 2011; Newman-Taylor, Harper & Chadwick, 2009).

The purpose of the study described in this chapter was to investigate the effectiveness and processes of change in a 10-session ACT individual intervention for people experiencing treatment-resistant distressing voices. At the time of planning this study (2007) there had only been two published trials of ACT with people experiencing psychosis (Bach & Hayes, 2002; Gaudiano & Herbert, 2006), conducted in the USA. Both of these trials employed very brief ACT interventions (up to 4 hours contact) in hospital settings with people who were acutely psychotic and received only limited community care (Bach & Hayes, 2002; Gaudiano & Herbert, 2006). Each of these trials recruited a mix of participants who were experiencing hallucinations and/or delusional beliefs. For the current study it was planned to develop an ACT protocol that was longer in duration, conducted in a community setting and focused upon people experiencing auditory hallucinations, to assess the initial effectiveness of this intervention for voice hearers in a United Kingdom context (access to community treatment, longer psychological therapy contact).

To explore the possible processes of change in an ACT intervention for psychosis, based upon the results of Study 1, changes in non-judgemental acceptance and psychological flexibility toward voices were assessed. The Voices Acceptance and Action Scale (VAAS; Shawyer et al., 2007) was used as a process measure to assess psychological flexibility in the context of voices (willingness to experience voices as a private event: acceptance; and independent action from voices). In addition, autonomy from voices and willingness to experience voices were measured session-by-session. Outcome measures included measures of auditory hallucination symptom severity, levels of depression and anxiety symptoms, social functioning, and quality of life.

6.2.1 Use of single-case methodology

A single-case design was adopted for this study. Single-case designs have a long history of use in behaviour therapy research (e.g. Barlow & Hersen, 1973, Leitenberg, 1973; Shapiro, 1966), and in the empirical development of cognitive therapy for psychosis researchers utilised single-case designs to provide useful early indications of efficacy and processes of change (e.g., Chadwick & Lowe, 1994; Chadwick, Lowe, Horne & Higson, 1994). Single case designs allow for the cost-effective investigation of processes of change in psychological interventions (e.g., Moras, Telfer & Barlow, 1993) when compared to group-based designs (Kazdin, 1998). These designs also allow for the detailed analysis of "non-responders" as well as "responders" (Barlow & Hersen, 1984). Replication across multiple participants using such designs can demonstrate intervention efficacy and effectiveness (e.g., Fisher & Wells, 2008), providing evidence that justifies investment in randomised control group designs.

6.2.2 The measurement of relational responding/ implicit beliefs

Finally, based on the implications of Relational Frame Theory (see Chapter 2), it was planned to pilot the measurement of relational responding to voices (in an accepting or non-accepting manner). This pilot was to explore whether changes in relational responding might be associated with outcome changes following ACT: whether participants would show an implicit preference toward acceptance rather than non-acceptance of voices. Measurement of this responding (using a response-timed computer task called the Implicit Relational Assessment Procedure(IRAP): Barnes-Holmes, Barnes-Holmes, Power, Hayden, Milne & Stewart, 2006) was

considered useful in providing a more objective method of determining change, as these methods are less susceptible to deception and self-presentational strategies, such as wanting to please the experimenter, which can occur with using self-report and interview methods (Barnes-Holmes et al., 2006).

In previous research with the IRAP, participants respond more slowly when asked to choose responses which represent the opposite of what they believe (e.g., Barnes-Holmes et al., 2006; Dawson et al., 2009) Comparisons of speed of responding between trials consistent and inconsistent with a target concept (e.g., an attitude) are then used to measure the strength of implicit belief (see below for a description of the IRAP).

In the context of this study, measuring relational responding using this approach was chosen to strengthen the validity of the single-case design, and was additionally an innovation in measurement for psychological interventions.

6.2.3 Research Questions and Hypotheses

The research questions were:

1) Does the introduction of acceptance and commitment therapy (ACT) result in outcome changes for people experiencing distressing voices?
2) Does ACT produce changes in psychological flexibility (mindfulness, acceptance) for distressed voice hearers?
3) Are there greater changes in distress and functioning, compared to frequency and duration of symptoms, following ACT for voices?
4) How does a pilot implicit measure of voice acceptance perform at baseline and following ACT for voices?

The following predictions were made:

1) Significant changes in outcome measures relating to levels of depression and anxiety symptoms, social functioning, and quality of life will only occur in the intervention phase. It is not expected that there will be significant changes in outcomes following the baseline phase of the study.
2) Significant changes in process measures (psychological flexibility, non-judgemental acceptance, willingness toward voices, autonomy from voices) will occur only once the intervention phase has commenced.
3) Significant changes in process measures will precede changes in outcome measures (i.e. for responders Mid Therapy assessments will show process changes, while significant outcome measure changes will only be evident at the End of Therapy).

4) No change is expected in outcomes not directly targeted by ACT, such as frequency of symptoms or auditory hallucination symptom severity.

It is expected that these changes will be significant at a single-case and group level.

6.3 Method

6.3.1 Ethical Considerations

This study received ethical approval in April 2008 from the South East Research Ethics Committee (NHS) (REC reference 08/H1102/11). Research & Development approval was obtained from the South London & Maudsley NHS Foundation Trust (see Appendix B-1 for relevant documentation).

6.3.2 Design

This study used a non-concurrent multiple-baseline, single case design (Barlow & Hersen, 1992) to investigate the intervention; the multiple baseline (1-4 weeks) was across participants divided into two groups (N=4 for each; 8 participants total), with randomised, sequential commencement to the intervention phase of the study. There were two phases, an assessment/baseline phase followed by an intervention phase (A-B design).

6.3.3 Preparatory work for the study

6.3.3.1 Development of a treatment manual

The intervention was based on the core clinical processes of ACT (Hayes, Strosahl & Wilson, 1999) and using the modifications for psychosis outlined by Pankey and Hayes (2003), Bach (2004) and Bach, Gaudiano, Pankey, Herbert & Hayes (2006). The treatment manual is listed in Appendix B-2.

The treatment manual was used as a guide for the intervention session content. Material from various ACT publications was incorporated in the intervention:

1. The general description of the ACT clinical processes (Luoma, Hayes & Walser, 2007)
2. The outline of the ACT assessment/ case formulation process (Lillis & Luoma, 2005)
3. The Tug of War with the Monster (Hayes, Strosahl & Wilson, 1999)
4. The Passengers on the Bus (Hayes, Strosahl & Wilson, 1999)
5. The Leaves on the Stream exercise (Hayes, Strosahl & Wilson, 1999)

6. The Mindfulness: Be Here Now handout (Hayes & Smith, 2005)
7. The "Minds are don't-get-eaten-machines" psycho-education handout (Ciarrochi & Bailey, 2008)
8. The Clean vs Dirty Discomfort Diary (from Hayes, Strosahl & Wilson, 1999)
9. The Two Mountains metaphor, to describe the therapeutic relationship (Hayes, Strosahl & Wilson, 1999)
10. Pain and Suffering circles (Hayes & Smith, 2005)
11. Two Scales metaphor (Hayes, Strosahl & Wilson, 1999)
12. A variation of the "White Bear" thought suppression exercise (Wegner, 1989)
13. The Chessboard Metaphor (Hayes, Strosahl & Wilson, 1999)
14. The River of Thoughts exercise (Pankey & Hayes, 2003)

In addition, worksheets and flashcards were created to reinforce several exercises, including the 'Passengers on the Bus' metaphor, a values clarification exercise, and a mindfulness prompt, as well as a session summary form, where the participant was asked to list the main points of each meeting, which they could peruse between sessions. These materials were illustrated with cartoons developed from the University of Wollongong, Australia to illustrate ACT concepts (http://www.uow.edu.au/health/ACTherapy/resources/index.html).

A compact disc of ACT and mindfulness exercises was created (narrated by the author). It contained the following exercises:

1) 5 minute Mindfulness (from Hayes & Smith, 2005)
2) Clouds Exercise (from Zettle, 2007)
3) Leaves in the Stream Exercise (from Hayes & Smith, 2005)
4) Lifetime Achievement Award (from Hayes, Strosahl & Wilson, 1999)
5) Free Experiencing Exercise (from Walser & Westrup, 2007)
6) Chessboard Metaphor (from Hayes, Strosahl & Wilson, 1999)
7) Observer Exercise (from Hayes, Strosahl & Wilson, 1999)

6.3.3.2 Adherence and competence Ratings

To check the fidelity of the ACT intervention being offered to participants, a measure of adherence was developed for the study.

The background for this measure was based on the literature of measuring psychotherapy adherence from a behavioural perspective (Waltz, Addis, Koerner, & Jacobsen, 1993). Waltz et al (1993) recommended that adherence measures should include four types of items:

1. Therapist behaviours that are both unique to that treatment modality and essential to it
2. Behaviours that are essential to the treatment but not unique to it

3. Behaviours that are compatible with the specified modality, and therefore not prohibited, but neither necessary nor unique
4. Behaviours that are proscribed

Similarly Waltz et al recommended that to determine whether a treatment has been adequately administered, there must be an assessment of therapist *competence*. Determining competence involves specifying how sensitively the treatment protocol is applied to individual clients, by considering the therapeutic context: a) stage of therapy, b) client difficulty, c) client presenting problems.

An ACT for psychosis adherence measure was developed based on these recommendations. This measure is in Appendix B-3; it asks the rater to judge the presence of ACT components in the session, appropriateness and client responsiveness to this component. It also asks for ratings of proscribed therapist behaviours, plus an overall rating.

The ACT components were based on the competencies outlined in the general training manual (not psychosis specific) of Luoma, Hayes and Walser (2007); their description of each of the competencies was included as an appendix in the measure (see Appendix B-3).

The proscribed therapist behaviours listed were based upon a combination of "ACT inconsistent techniques" (Luoma, Hayes & Walser, 2007) and cognitive techniques described in the Cognitive Therapy Scale for Psychosis Adherence Scale (CTPAS; Startup, Jackson & Pearce, 2002), in particular "Evidence for Delusional Beliefs", "Validity Testing/ Behavioural Experiments", "Colombo Style", and "Verbal Challenge of Delusions". For the proscribed behaviours these were rated for the degree of presence in the session.

Adherence was judged by the presence of ACT components and absence of proscribed therapist behaviours. Competence was judged by presence, appropriateness and client responsiveness, along with the absence of proscribed therapist behaviours.

6.3.3.3 Development of a relational responding assessment (IRAP)

Choosing Acceptance and Experiential Avoidance Words

To develop the sets of words to be used in the IRAP task nine experienced ACT therapists were asked to rate word lists generated by the author, in a range from 0 to 10 (where 0 is no agreement, and 10 is complete agreement) according to how closely they fit with the definitions of 1) acceptance, and 2) experiential avoidance. The lists of words generated

appear in Table 5.3. The same set of words was rated for each definition (presented in a different order), with the intention to take the three highest-rated words in each category, as stimuli in the IRAP task. The definitions were:

> *"Acceptance = the active and aware embrace of those private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm. (Hayes, Luoma, Bond, Masuda & Lillis, 2006)"*

> *"Experiential avoidance = when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them, even when this process is unhelpful (Hayes, Wilson & Strosahl, 1999)"*

Ratings were averaged across the nine therapists for each definition (acceptance or experiential avoidance). As can be seen from Tables 6.1 and 6.2, the ratings were unambiguous for either definition - with the three highest-rated words for acceptance (Let Be, Accept, Allow) and experiential avoidance (Block Out, Resist, Suppress).

Table 6.1 – Mean ACT therapist ratings for acceptance words (N=9)

Word/ Phrase	Mean	SD
Resist	0.6	0.7
Allow	8.6*	1.2
Block out	0.2	0. 7
Obey	2.9	2.1
Fight	1.0	1.2
Reject	1.4	1.3
Love	7.2	2.0
Choose	6.4	1.3
Ignore	3.8	1.5
Dislike	3.3	1.6
Interrupt	3.0	1.6
Accept	9.0*	1.0
Argue with	2.7	1.6
Suppress	1.1	0.9
Let be	9.00*	0.9
Forgive	7.7	1.4
Control	1.4	1.0
Struggle with	2.0	1.3
Listen to	6.0	2.4
Be kind to	7.3	1.6
Follow	4.2	2.1
Like	4.8	2.7

Table 6.2 – Mean ACT therapist ratings for Experiential Avoidance words (N=9)

Word/ Phrase	Mean	SD

Interrupt	7.1	1.2
Allow	1.1	0.9
Dislike	5.7	2.5
Listen to	2.8	1.8
Follow	3.8	1.9
Struggle with	7.2	2.3
Love	1.6	1.7
Obey	4.7	2
Ignore	6.8	1.6
Let be	0.9	0.9
Like	3.2	2.5
Accept	0.8	1.0
Argue with	8.0	1.3
Suppress	8.9*	0.9
Be kind to	2.2	1.8
Forgive	1.8	1.8
Control	8.7	1.2
Reject	8.7	1.2
Resist	9.0*	0.7
Block out	9.2*	0.8
Fight	8.2	1.6
Choose	3.2	1.8

A description of the IRAP

The IRAP is presented on a computer, with practice trials and then a fixed set of six test blocks. Each block has the same number of trials, and on each trial one of two label stimuli is presented at the top of the screen, with one of two types of target stimuli presented in the center; the participant is required to choose between two response options, which appear the bottom left and right of the screen. These choices are made using the "D" or "K" key, and the positions of the response options shift left-right randomly from trial to trial.

The test blocks are organized into consistent and inconsistent sets of trials: consistent trials involve responses that are synonymous with established verbal relations (e.g., voices are to be avoided), while in inconsistent trials the participant has to respond in the opposite manner (e.g., voices are to be accepted).

Based on email correspondence with, and a visit to, Professor Dermott Barnes-Holmes at the National University of Ireland, Maynooth in 2007, the IRAP task was constructed so that participants would respond to word sets related to acceptance or experiential avoidance, in the context of "Voices" or a "Close Friend". The "Close Friend" label was chosen to provide a comparator during the experiment that was similar to "Voices", in that it was stimuli that a

person responded to potentially in a similar manner to voices. Figure 6.1 presents the four different trial types that occur within each block.

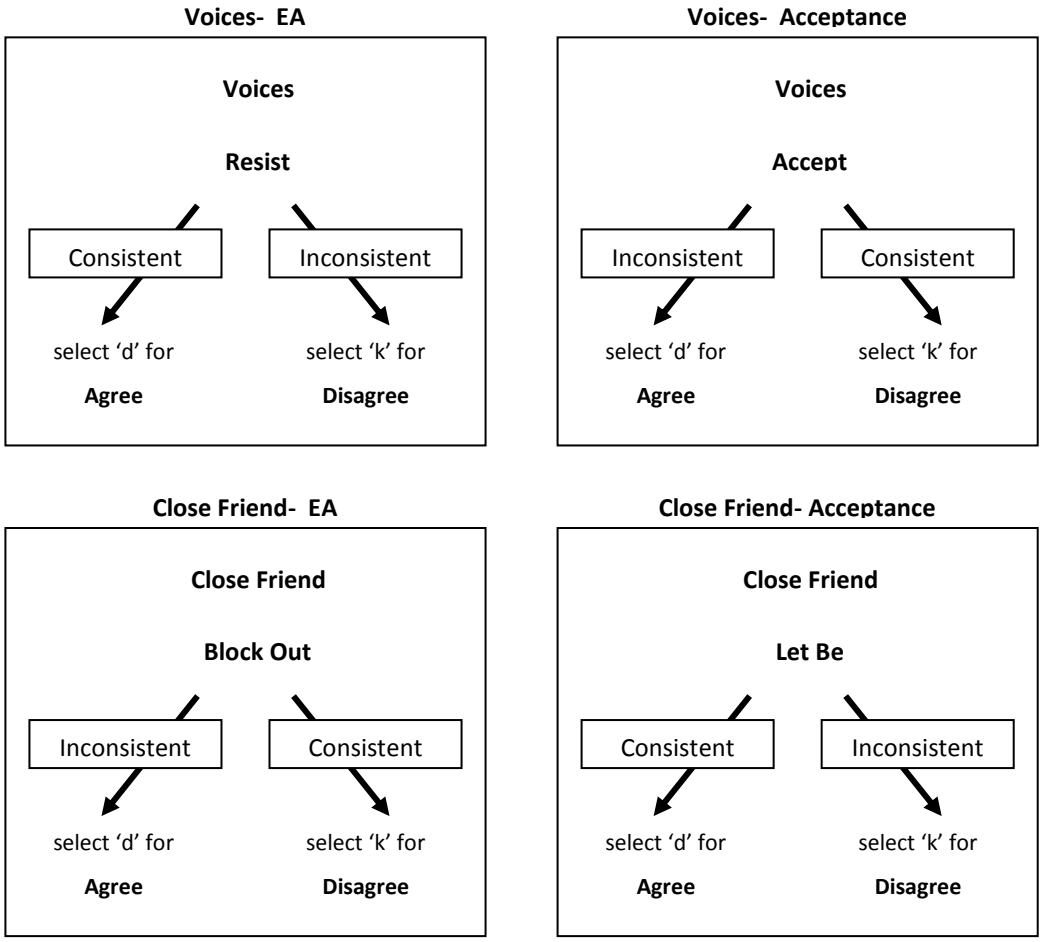


Figure 6.1 Example of four IRAP trial types for the study

On each trial the label ("Voices" or "Close Friend"), target word (either Acceptance /EA words – let be, accept, allow or resist, block out, suppress), and response options (Agree, Disagree) appeared simultaneously. In Figure 6.1 the arrows with superimposed text boxes indicate which responses are considered consistent or inconsistent (boxes and arrows do not appear on the screen). If the participant selected the consistent response option during a consistent trial, or the inconsistent response option in an inconsistent trial, the screen was cleared for 0.4 seconds before the next trial was presented. If an inconsistent response option was chosen during a consistent block, or a consistent response option during an inconsistent block, a red X appeared on the screen. This red X stayed on screen until the participants chose the alternative response.

For the purpose of the study, however, only the responding within the label of Voices was planned to be used for the analyses. The speed of responding was measured between "consistent" and "inconsistent" (reversed) trials for acceptance vs experiential avoidance (EA) words; the difference in timed performance between original and reversed trials is then used to measure the strength of implicit belief (in this case for symptom avoidance). It was assumed that the "consistent" trials might reflect prior (and normative) learning, in terms of responding to voices. Thus the IRAP task was made up of four different trial types, created by presenting each label with two sets of target words (see Figure 6.1). A block of consistent trials would require the following responses: Voices-[EA word]-*Agree*, Voices-[Acceptance word]-*Disagree*, Close Friend-[EA word]-*Disagree*, Close Friend-[Acceptance word]-*Agree*. In contrast the block of inconsistent trials that followed would require these responses: Voices-[EA word]-*Disagree*, Voices-[Acceptance word]-*Agree*, Close Friend-[EA word]-*Agree*, Close Friend-[Acceptance word]-*Disagree*.

Piloting the IRAP

Five participants who had completed the first study were invited to participate in piloting the IRAP task.

The aim of this pilot was to ascertain whether voice hearing participants 1) find the IRAP acceptable and easy to learn, and 2) meet criterion for a "valid" IRAP response, by responding within the cut-off of 10 seconds. The criterion for a valid IRAP was based upon the work by Vahey et al (2010), studying implicit self-esteem in prisoners: this group established the

convention that responses over 10 seconds would be excluded from analyses, as these responses are considered to be too long in duration to reflect an "implicit" response.

Acceptability was assessed by feedback from the participants, an initial training phase where participants would develop fluency in the IRAP, and whether the participants tolerated the task, by completing all the IRAP trials.

Assessment of whether pilot participants could produce valid IRAP responses was assessed through using a fluency task, and then if fluency was established, subsequent performance on the six trial IRAP.

The fluency task involved participants correctly matching 80% of neutral terms, each within a 3-second latency period. The neutral terms chosen were the labels "shape" and "colour", with target words from these categories (i.e., circle, square, triangle; red, blue, yellow), and the response option of same/ different. Thus participants were asked to match words as to whether they fitted in the label category. The use of neutral words for the fluency task was to ascertain if pilot participants could achieve criterion, with stimuli that were likely not to be evocative or related to their clinical problems.

This matching task was simpler than the full IRAP in that it did not involve inconsistent trials: pilot participants only had to correctly match 80 per cent of the shape/colour words. This was done in order to establish whether participants could produce fluent responses, once familiar with the computer task. During the fluency task participants were given feedback on the computer screen about whether their responses were correct (a red X appeared on screen if not); if the participant did not match at least 80% correctly in the first block (12 trials), they were asked to complete a second block to establish if they could achieve criterion. If successful at this in the fluency task, participants were then asked to complete the six block Voices IRAP, with the changed criterion of validity of providing <15% of responses longer than a 10 second latency.

Thus the pilot was conducted in two sections:

1) a training phase, that introduced the participant to the IRAP using neutral terms to respond to (matching shape and colour words), and

2) the IRAP task with the acceptance and experiential avoidance words related to Voices and a Close Friend (see above for a description of this).

A summary of the pilot participants' performance appears in Tables 5.5 and 5.6 below.

Fluency - It can be seen from Table 6.3 that all pilot participants achieved fluency in the matching task within 24 trials (two blocks of stimuli presented, 12 in each block), with four out of the five participants achieving this within the first presentation block. Additionally all participants were able to respond over 50% of the time in less than 5 seconds to the trial stimuli, and responses that would be considered invalid (> 10 seconds) were minimal for four out of five participants, with one participant (Pilot 4) responding 25% of time with long responses.

Valid IRAP responses - All five pilot participants were then asked to complete the six block Voices IRAP, the results of which can be seen in Table 6.4. As can be seen all participants responded within the 15% response latency limit for validity (with the highest number of responses > 10 seconds being 11.1%). In terms of responding three pilot participants (1, 3 and 5) showed a style of responding suggestive of preferring non-acceptance with voices, while Participant 4 showed a preference for acceptance. Participant 2's response times suggest a lack of preference for either acceptance or non-acceptance, in relation to voices.

Based on the successful pilot of the IRAP, it was included in the main study as a potential measure of implicit relational responding.

Table 6.3 Pilot performance on the IRAP: Fluency – Colour and Shape words

Participant	# trials until 80% correct	Errors	Mean latency (s)	SD	Range	Percentage < 5s	Percentage > 10s
Pilot 1	24	4	3.125	2.297	1.328 – 12.297	87.5	4.2
Pilot 2	12	0	6.707	5.906	2.531 – 20.500	58.3	16.7
Pilot 3	12	1	5.085	2.780	2.703 – 11.453	66.7	8.3
Pilot 4	12	1	6.369	4.924	2.109 – 15.031	58.3	25
Pilot 5	12	1	8.708	12.718	2.390 – 46.484	66.7	16.7

Table 6.4 Pilot performance on the IRAP: Responses to voices – Acceptance and Non-Acceptance

Pt	**Acceptance Mean latency (s)**	**SD**	**Non-Acceptance Mean latency (s)**	**SD**	**%age > 10s**	**D^{IRAP} Acceptance**	**D^{IRAP} Non-Acceptance**	**Effect score difference**
Pilot 1	2.933	0.737	2.214	0.693	0	3.695	2.789*	-0.906
Pilot 2	3.550	1.420	3.626	1.329	6	2.614*	2.669	0.055
Pilot 3	5.131	2.027	4.678	2.013	0	2.559	2.333*	-0.226
Pilot 4	3.458	2.008	4.440	2.050	6	1.681*	2.158	0.477
Pilot 5	6.157	2.103	4.469	2.130	11.1	2.736	1.985*	-0.751

D^{IRAP} = effect score calculated for each trial type (acceptance and non-acceptance) by dividing the mean by the pooled standard deviation

6.3.4 Participants

The participants were eight service users of community mental health services, recruited while on waiting lists for psychological therapy (cognitive behavioural therapy for psychosis). Potential participants were recruited from community-based psychosis services in the South

London & Maudsley NHS Foundation Trust, including teams for early intervention and recovery. In addition recruitment occurred from a specialist therapy service for psychosis (PICuP: Psychological Interventions Clinic for outpatients with Psychosis). Due to recruitment occurring while participants were on waiting lists, this study did not assess outcome at a follow-up period (when people were subsequently engaged in cognitive behavioural therapy).

6.3.4.1 Inclusion and exclusion criteria

Participants were recruited who satisfied the inclusion criteria of the study:

1) 18 years or older;

2) experiencing persisting (over 12 months in duration), treatment-resistant auditory hallucinations perceived by the participant to be distressing and/or disabling;

3) on a stable medication regime and engaged in community mental health care;

4) not currently engaged in cognitive behavioural therapy, or having completed therapy in the past 12 months.

Figure 6.2 shows the flow diagram for study recruitment.

There were challenges in recruitment, with half of the participants recruited dropping out of the study (eight from sixteen recruited). Four dropped out or declined to participate after giving consent and completing the first assessment; one participant dropped out during the baseline phase; and three participants dropped out during the intervention phase (within the first three ACT sessions). Of those participants who dropped out during the intervention phase - one participant moved to another part of the country and could not continue sessions, one participant did not like engaging in mindfulness exercises or talking about values, finding it confusing; one participant did not want to engage in therapy if the approach could not guarantee that his voices would stop.

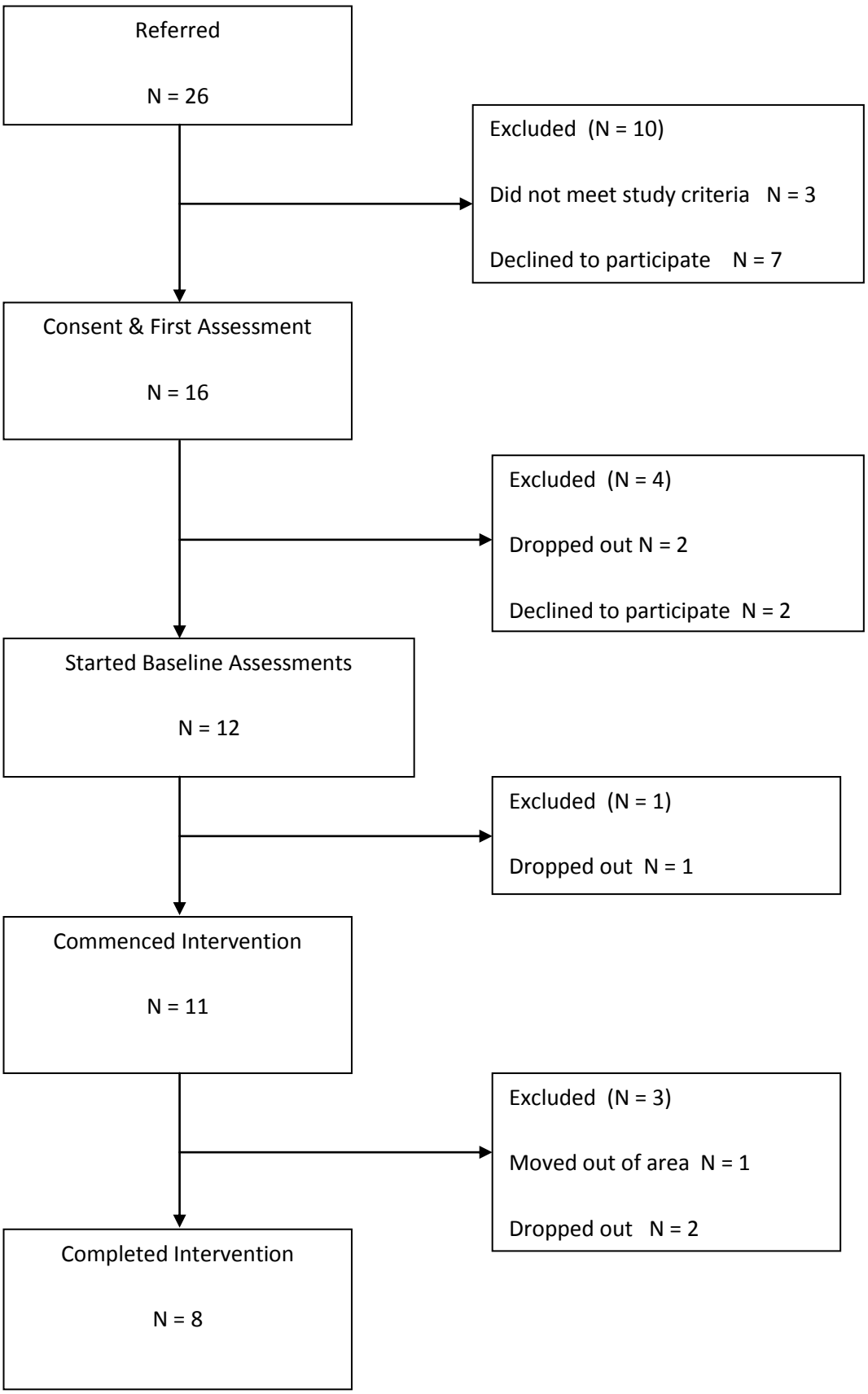


Figure 6.2 Flow diagram of Study 2 participant recruitment

The sample demographics appear in Table 6.5. As can be seen the participants were 5 males, 3 females; aged 27 – 54. In terms of ethnicity four were White British, and four were from a Black or Minority Ethnic background. None of the participants were in paid employment, although three were engaged in voluntary work. All participants were on a stable medication regime and receiving a care package of community mental health care.

Table 6.5 Study 2 Participant demographics

Participant	Age	Gender	Ethnicity	Employment	Relationship	Diagnosis	Length of time hearing voices
1 "Andrew"	52	Male	Black British	Unemployed, does voluntary work 3 days/week	Divorced	F20 - Schizophrenia	28 years
2 "Brian"	50	Male	White British	Unemployed	Partner	F32.3 - Depression with psychotic features	2 years
3 "Charles"	30	Male	White British	Unemployed, does voluntary work 2 days/week	Single	F20 - Schizophrenia	10 years
4 "David"	28	Male	White & Black African	Unemployed	Single	F20.0 - Paranoid Schizophrenia	10 years
5 "Edward"	54	Male	Mixed	Unemployed	Single	F20.0 - Paranoid Schizophrenia	17 years
6 "Fiona"	48	Female	Black British	Unemployed	Single	F20.0 - Paranoid Schizophrenia	12 years
7 "Grace"	33	Female	White British	Unemployed	Single	F20 - Schizophrenia	9 years
8 "Heidi"	30	Female	White British	Unemployed, does voluntary work 1 day/week	Partner	F25.0 - Schizoaffective Disorder	7 years

No participant had a change in medication during the period of the study; similarly, no participants were hospitalised or received home treatment during the study period.

Participants had been hearing voices from 2 to 28 years. Seven participants had ICD-10 F20.0 Schizophrenia-spectrum diagnoses; one participant had a primary Mood Disorder diagnosis, with psychotic features. The participants' experience of auditory hallucinations is described in Appendix B-4.

6.3.4 Measures

6.3.4.1 Session ratings

Participants were asked to rate process measures at the start of each assessment and intervention session, involving multidimensional measurement of hearing voices, measured as a self-report percentage scale/ visual analogue for each variable: conviction/ believability, frequency, associated distress, preoccupation, degree of autonomy from symptoms, willingness to experience symptoms. This measure is presented in Appendix B-5.

6.3.4.2 Outcome and Process Measures

Outcome measures

The Psychotic Symptoms Ratings Scales – Auditory Hallucinations sub-scale (PSYRATS-AH; Haddock et al., 1999; See Appendix A-2.7) - Please refer to Chapter 5 for a description of this scale (in the Measures section 5.3.4).

Beck Depression Inventory-II (BDI-II; Beck, Steer & Brown, 1996; See Appendix A-2.4).

Please refer to Chapter 5 for a description of this scale (in the Measures section 5.3.4).

Beck Anxiety Inventory (BAI; Beck & Steer, 1990; See Appendix A-2.5)

Please refer to Chapter 5 for a description of this scale (in the Measures section 5.3.4).

Manchester Short Assessment of Quality of Life (MANSA; Priebe, Huxley, Knight & Evans, 1999; see Appendix B-6.1). This a 16-item measure comprising questions related to satisfaction with various domains of life. The subjective items assess satisfaction with life as a whole, job (or sheltered employment, or training/education, or unemployment/retirement), financial situation, number and quality of friendships, leisure activities, accommodation, personal

safety, people that the individual lives with (or living alone), sex life, relationship with family, physical health and mental health. Items are rated on a 7-point satisfaction scale, from 1='Couldn't be worse' to 7='Couldn't be better'. The summary score for the MANSA is the mean of the 12 subjective items (range 1 to 7, the higher the score the better the quality of life). The MANSA has been found to have adequate internal consistency and construct validity as a measure of quality of life in severe mental illness samples (Priebe et al., 1999; Bjorkman & Svensson, 2005).

Social Functioning Scale (SFS; Birchwood, Smith, Cochrane, Wetton & Copestake, 1990; see Appendix B-6.2). This 79-item scale is designed to assess social functioning in schizophrenia. It asks about performance and abilities in seven areas: social engagement, interpersonal communication, activities of daily living, recreation, social activities, competence in daily living, and occupation/ employment. The measure was completed in this study by the participant. Subscale raw scores are converted into scaled score equivalents with a mean of 100 and a standard deviation of 15, using the original standardisation sample of the scale (Birchwood et al., 1990). The SFS has been shown to be a reliable, valid and sensitive measure of social functioning (Barrowclough & Tarrier, 1990; Birchwood et al., 1990).

Process measures

Voices Acceptance and Action Questionnaire (VAAS; Shawyer, Ratcliff, Mackin, Farhall, Hayes & Copolov, 2007; see Appendix B-6.3). This 31-item questionnaire measures acceptance of the experience of auditory hallucinations (acceptance, and the ability to live purposefully even whilst experiencing voices (action). Participants are asked to respond on a 5-point scale from Strongly Disagree (=0) to Strongly Agree (=4), giving a scale scores ranging from 0 to 64 (acceptance), and 0 to 60 (action). Higher scores indicate greater acceptance and independence from voices. The VAAS and its subscales demonstrates adequate internal consistency with a Cronbach's α of between .76 and .90 for subscales, high test-retest reliability (ranging 0.72 to 0.82 for subscales).

Kentucky Inventory of Mindfulness Skills (Baer, Smith & Allen, 2004; See Appendix B-6.4). Please refer to Chapter 5, section 5.3.4 for a description of this scale. Based on the results of the first study (described in Chapter 5), only the Acceptance Without Judgement (KIMS-AWJ) subscale of the KIMS was used for this study, as a measure of non-judgemental acceptance.

6.3.4.3 Relational responding task (IRAP)

The Implicit Relational Assessment Procedure (IRAP; Barnes-Holmes et al., 2006), is a response-timed, computer-based matching task to assess the strength and direction of implicit beliefs for a target concept. The development of this measure is described above, in Section 6.3.3.3.

The IRAP program was run on a Dell Inspiron computer. In the first assessment participants were introduced to the IRAP by practicing with the matching task described in the pilot work (colour/shape words), and meeting the criterion of correctly matching 80 per cent of the words (all participants did this within one test block).

The IRAP then involved participants matching over six blocks of 12 trials experiential avoidance and acceptance words and phrases (such as “block out”, “reject”, “allow”, “let be”) in correspondence to a target label, in this case “voices” or “close friend”. The format of the presentations was similar to that presented in Figure 6.1: words were presented in large black font in the centre of a grey screen; the words would remain on screen until a correct response, if an incorrect response was made a red X would appear and the participant would be instructed on-screen to respond again. If a correct response was made then the screen would go blank for 0.4 seconds before another trial would start.

At the start of the IRAP participants were given the instruction from the researcher that it was a matching task, and that the computer will inform them when they have made a correct match between the words presented, giving them the opportunity to make the correct match if their first response is incorrect (Participants weren’t prior to the IRAP task about which responses were correct in the first block, they were supposed to work it out themselves over time, based on the computer’s feedback). Participants were also instructed to respond as quickly as they could, while limiting guessing or making random responses.

Participants were then presented with the first block of matching words (a “consistent” block, in that the correct answer to words related to experiential avoidance and voices was “agree” and to acceptance words, “disagree”). Once the participant correctly matched all words (by correct first responses, or providing the correct response after receiving feedback that their first response was wrong by seeing a red X on the screen; see description earlier in Section 6.3.3.3), they then commenced the next block.

In the second block participants were instructed on-screen that the relationships between the words were reversed, so that the previously-correct responses were now wrong and the task involved responding in an opposite manner (an "inconsistent" block, reversed relations as described earlier and in Figure 6.2). Following completion of this block the IRAP repeated through four more blocks of trials, in order of blocks Consistent-Inconsistent-Consistent-Inconsistent (six blocks of trials).

After each trial, participants were given feedback from the IRAP program on their accuracy and speed in responding, in the form of a score appearing on the screen. This was done to increase participants' motivation in completing the task, through "beating their score". Completion of six blocks of the IRAP took participants fifteen minutes on average.

6.3.5 Procedure

The participants were recruited into two groups (four in each). Group allocation was sequential, with the first four participants in the first group, and the second four in the second group. Allocation for Baseline length (1-4 weeks) was randomised within each group. For the purpose of this report participants are described by their order in the group, rather than the order that they were recruited to the study.

Following informed consent the study commenced with the first Assessment session (Start Baseline), which involved the participant completing the process and outcome measures for the study. The Baseline Phase then commenced (for 1-4 meetings), before a second Baseline Assessment (End Baseline), and then the introduction of the Intervention Phase in a subsequent session. The Intervention Phase involved 5 sessions of ACT, and then an Assessment session (Mid-Therapy), followed by another 5 sessions of ACT. The study then ended with a final Assessment session (End Therapy).

6.3.5.1 Assessment Procedure

Participants were asked to rate process measures at the start of every session, involving multidimensional measurement of hearing voices measured as a self-report percentage scale/ visual analogue.

Participants were asked to complete the outcome and self-report measures of mindfulness/acceptance at four time points: prior to the baseline phase, at the end of the baseline phase, session 5 of the intervention, and at the end of the intervention phase.

6.3.5.2 Baseline

The baseline phase involved the researcher meeting with the participant and for 1 - 4 assessment sessions (as described above), during these sessions the participant was asked to complete the process measures. These sessions were conducted by the author; all involved face-to-face meetings. In addition to the process measures these sessions involved building engagement with the participant and gaining a sense of the presenting problems that the participant was bringing to therapy. No problem-solving, normalising, or other active intervention methods were used by the therapist during the Baseline sessions.

6.3.5.3 Intervention

The intervention involved 10 sessions in the form of audio-recorded, weekly therapy sessions with a psychologist trained in the ACT approach (the author). The intervention was based on a treatment manual, developed by the author and described in Section 6.3.3.1 above. The treatment manual is in Appendix B-2.

The participants were given the compact disc from session 2 and encouraged to use it as a form of home practice. In each ACT session there was brief discussion of how the participant was finding using the compact disc, and when exercises were introduced in the session, it was reinforced that the exercise was also on the compact disc to review before the next session.

6.3.5.4 Adherence Ratings Procedure:

An ACT expert, Prof Frank Bond (Goldsmith's, University of London) was asked to use this measure to rate audio-recordings of complete therapy sessions for two out of the first four participants (within the timescale that Prof Bond was available these were the only sets of recordings available). He was given a brief, anonymised synopsis of the participant background and asked to select randomly sessions from the beginning (sessions 1-3), middle (4-7) and end (8-10), rating three sessions out of the possible ten for each participant.

Adherence Ratings Given
For all of the sessions rated there were judged to be no *proscribed* behaviours present in the recordings.

All recordings were rated to be adherent to the ACT treatment model; similarly the therapist was rated to be competently providing the intervention. The ratings for the session adherence appear in Appendix B-7.

6.3.6 Data Analysis Strategy

It was planned to analyse the data on two levels, and across the phases of the study: 1) within each participant's measures (single case methods), and 2) at the level of the group. The methods used for data analysis are listed in Table 6.6; for each set of measures (outcome and process; session-by-session ratings; IRAP scores) the methods will be discussed in terms of these two levels.

Table 6.6 Methods of Analysis by Single Case- and Group-Level

Measure	Level of Analysis	
	Single Case Method	Group Method
Outcome & process measures	Reliable Change Indices	Wilcoxon Signed Rank Test
Session ratings	Tau-u	Tau-u omnibus score
Relational Responding (IRAP scores)	D^{IRAP} effect score	Average D^{IRAP} scores: responders vs non-responders

6.3.6.1 Outcome and process measures

Single-case method
The outcome and process measures across the four assessment periods (Start of Baseline, End Baseline, Mid Therapy, End of Therapy) were analysed by comparing changes in participants' scores against a Reliable Change Index (RCI), where reliable change is defined as a change greater than would be expected due to measurement error (Jacobson & Truax, 1991). Thus,

the RCI is a measure of whether a change in a participant's score is statistically significant: it is defined as the change in a participant's score divided by the standard error of the difference for the test being used (Jacobson & Truax, 1991; Martinovich, Saunders & Howard, 1996).

The level of significance chosen for these analyses was $p < .05$; therefore a cut-off RCI score of +/- 1.96 suggests a significant change. The means and standard deviations for the RCI analyses were based on the data produced in the first study of this thesis; the test reliability scores (to calculate the standard error of the difference) were taken from published material for each measure (cited in the Measures section), using the internal consistency method for clinical populations recommended by Martinovich, Saunders and Howard (1996). For measures that were not included in the first study, data from published samples were used (MANSA: Priebe et al., 1999; VAAS: Shawyer et al., 2007; SFS: Birchwood et al., 1990).

Each participant's scores on the outcome measures were subjected to a RCI analysis comparing changes in scores from the following phases:

1) Start of Baseline - End Baseline (to establish whether there was a stable baseline),

2) End Baseline - Mid Therapy (to ascertain changes in process measures, as hypothesised),

3) End Baseline - End Therapy (to assess changes following the intervention, pending stability in the baseline)

For the purposes of clarity the RCI scores are reported as a negative score representing reliable improvement, and a positive score indicating reliable deterioration.

Group Method

The outcome and process measures were also compared at a group level across the four assessment periods, using the Wilcoxon Signed Rank Test (rather than a paired samples t-test, as the data were not normally distributed).

6.3.6.2 Session ratings

Single-case method

Statistical analyses were conducted using the Tau-u statistic, as recommended by Parker, Vannest, Davis and Sauber (2011) and Barnett et al. (2012) for use in single-case research. The

Tau-u is a non-parametric statistic that combines Kendall's Rank Correlation and the Mann-Whitney U test (Parker *et al.*, 2011), producing an index of change between two phases. The Tau-u is a measure of non-overlap between study phases, combined with an analysis of trend in phase B (the intervention), which is established by the percentage of data-points that improve during the phase. The Tau-u can be used to establish whether there is a significant difference between the phases, and has been found to be a robust measure of non-overlap, with advantages compared to other statistical methods in single-case research in being able to control for baseline positive trends. Parker et al. (2011) have demonstrated that the Tau-U performs reasonably well with auto-correlated data, which occurs in single case designs as each measurement is not independent from preceding points; controlling for auto-correlation is important to avoid Type I errors.

For the analyses of the study data it was sought to establish whether there was a significant degree of non-overlap between the study phases, Baseline (A) and Intervention (B), using the Tau-u analysis that controls for baseline positive trend. The level of significance chosen for these analyses was $p < .05$; the Tau-u analyses were reported as the statistic and a confidence interval (90% CI).

Group Method

Group level analysis of the session ratings was conducted by combining derived Tau-u scores for participants for the particular measure, to produce an omnibus score of the Tau-u results, reported as a confidence interval (90% CI) in order to determine significant effects (i.e., not crossing the zero line).

6.3.6.3 IRAP scores

Single-case method

The IRAP data for each assessment phase were analysed in the following manner (using the recommendations from Barnes-Holmes, Barnes-Holmes, Stewart & Bowles, 2010):

1) only response-latency data for "Voices" from the test blocks were used (the "Close Friend" response times were not used in any of the study analyses)

2) individual responses that were > 10 seconds were discarded from the analyses

3) a participant's set of responses were considered invalid if there were more than 10% responses in any given block with latencies of less than 0.3 seconds.

4) for each trial type of acceptance and non-acceptance words (consistent and inconsistent) related with "Voices" a mean and standard deviation was calculated. This comprised the performance across the six test blocks of 36 trials (nine trials in each of the four types; i.e. Acceptance words x consistent trials, Acceptance words x inconsistent trials, Non-acceptance words x consistent trials, Non-acceptance words x inconsistent trials).

5) An effect score (D^{IRAP}) was calculated for relations each trial type (consistent and inconsistent) by dividing the mean by the pooled standard deviation

6) An effect score difference was calculated by subtracting the effect score for acceptance relations (the inconsistent trials) from the effect score of the non-acceptance relations (consistent trials), for words in relation to "Voices".

The *effect score difference* provides the direction of the relation (the participant's preference), as well as an estimate of the strength of that direction (Barnes-Holmes et al., 2010). Thus a score in a positive direction suggests a preference for acceptance, while non-acceptance is suggested by a negative score, with the magnitude of this difference suggesting how strong the preference is.

Thus, mean difference scores were interpreted as indicating how quickly a participant was responding to acceptance words in relation to speed of response to experiential avoidance words, in the context of Voices.

Group Method

It was planned to compare the IRAP performance for those that responded to the ACT intervention, with those that did not, by creating mean D^{IRAP} scores for each group. These mean difference scores would then be compared (see the Results section below for a discussion).

6.4 Results

The results of this study are reported in several ways in this section. Summary information and data for the group of participants are reported, and group-level analyses presented. Then participant data were analysed individually using indices of statistically reliable change (for outcome and process measures), and the Tau-u statistic to determine the significance of data

overlap and positive trend (for session-by-session ratings). Finally relational responding data (the IRAP) are subject to comparisons between those participants judged to have responded to the ACT intervention, and those who did not.

6.4.1 Descriptive statistics for the Group

Table 6.7 lists the sample means and standard deviations for the study variables. These data are for the whole sample (Groups 1 and 2).

Table 6.7 Sample Means and Standard Deviations for Outcome and Process Measures

	Baseline Start Mean	SD	Baseline End Mean	SD	Mid Therapy Mean	SD	End Therapy Mean	SD
PSYRATS	30.63	3.34	29.13	4.52	28	3.63	24.5	11.28
BDI	36.5	13.90	28	13.64	26.5	14.44	21.625	11.65
BAI	31.5	11.33	29	7.87	23.625	8.99	22.5	14.65
MANSA	3.39	0.72	3.72	0.78	4.06	0.99	4.42	0.94
SFS	101.9	6.45	102.9	8.84	103.1	7.26	107.4	8.26
KIMS-AWJ	25.579	6.34	19.375	4.69	24.875	9.01	26.125	8.31
VAAS-Acceptance	30.625	3.70	31.875	1.81	32.75	6.96	37	7.33
VAAS-Action	29.625	7.74	33.125	6.64	31.75	8.81	38.875	7.75

6.4.2 Comparison with other samples

The levels of symptom severity for the auditory hallucinations at baseline are similar to previous samples reported for people experiencing persisting distressing auditory hallucinations (e.g., Haddock, McCarron, Tarrier, & Faragher, 1999; Penn et al., 2009). Similarly the baseline scores for non-judgemental acceptance (KIMS-AWJ), acceptance of voice experience and action independent from voices (VAAS) are similar to published studies (White et al., 2011; Shawyer et al., 2007). Compared to the voice hearing samples described by Penn et al (2009) for a randomized controlled trial of CBTp vs supportive therapy, the study sample had higher levels of depressive symptoms, and poorer social functioning.

6.4.3 Outcome and process measures: Single Case analyses (Reliable Change Indices)

Baseline Phase changes

It can be seen from Table 6.8, in the Start of Baseline - End Baseline RCI analysis, that several participants did not show a stable baseline for the outcome variables.

Participant 7 showed a reliable improvement on symptom levels for auditory hallucinations (PSYRATS) during the baseline phase, although at the end of baseline was still experiencing voices to a clinically significant level.

For depression scores there was a reliable deterioration for Participant 4, and reliable improvements for Participants 2, 7 and 8. For anxiety scores there was a reliable deterioration for Participant 5, and improvements for Participants 2 and 8. For quality of life there was a reliable deterioration for Participant 4, and reliable improvements for Participants 7 and 8.

Only one participant showed a reliable change on a process measure, with Participant 7 showing a reliable improvement in non-judgemental acceptance (KIMS-AWJ). This participant did not show any other changes on process measures during the Baseline Phase.

Thus overall Participants 2 and 5 showed reliable deterioration on an outcome measure during the Baseline phase, while Participants 4, 7 and 8 showed improvements on one or two outcome measures. Participants 4, 7, and 8 all showed a mixed picture of improvements and deterioration.

Table 6.8 - Reliable Change Indices for Phases, Start of Baseline – End Baseline

Pt	Voice Symptom Levels (PSYRATS)	Social Functioning (SFS)	Depression (BDI-II)	Anxiety (BAI)	Quality of Life (MANSA)	Acceptance (KIMS-AWJ)	Voices Acceptance (VAAS)	Voices Action (VAAS)
#1	1.10	0.92	0.63	0.947	0.68	-0.23	-0.18	0.58
#2	-.082	-1.16	-3.57*	-3.22*	-1.81	-0.23	-0.91	-1.95
#3	0.82	-0.30	-0.42	-0.76	-1.81	0.69	0	-1.17
#4	1.37	-0.10	2.73*	-0.95	2.27*	1.83	-0.91	-0.39
#5	0	-0.10	-1.05	2.65*	-1.13	-1.14	-0.18	-1.36
#6	-0.82	1.00	0	-0.19	0.45	-0.23	0.91	0.20
#7	-2.47*	0.14	-7.35*	-0.19	-2.49*	-2.29*	-0.36	0.78
#8	-1.65	-1.88	-5.25*	-2.08*	-3.40*	-0.92	-0.18	0.58
	1 improved		3 improved 1 worsened	2 improved 1 worsened	1 worsened 2 improved	1 improved		

*= significant at p<.05
NB a positive score represents deterioration, and a negative score an improvement

Changes from Baseline to Mid therapy

It can be observed from Table 6.9 that the RCI analysis suggests reliable changes for several participants. Participant 7 showed a reliable deterioration in depressive symptoms, while Participants 3, 4 and 5 showed reliable improvements in levels of anxiety symptoms. Participant 2 had a reliable deterioration in quality of life, while Participant 4 showed improvement.

On the process measures Participants 4 and 6 showed reliable improvements in non-judgemental acceptance and Participant 7 had a reliable improvement in terms of independent action from voices. Participant 3 showed a reliable deterioration in independent action from voices.

In summary, for the period from the end of the baseline phase until the mid-therapy assessment, four participants showed a reliable improvement on one outcome measure (Participants 2, 3, 4 & 5), and one on a process measure (Participant 3). Two participants showed a reliable deterioration (Participant 7; depressive symptoms; Participant 4, quality of life), with a further 3 participants showing deterioration in one process measure (Participants 4, 6, and 7). Participant 4 was the only participant to show a mixture of improvement and deterioration.

Table 6.9 - Reliable Change Indices for Phases, End of Baseline - Mid Therapy

Pt	Voice Symptom Levels (PSYRATS)	Social Functioning (SFS)	Depression (BDI-II)	Anxiety (BAI)	Quality of Life (MANSA)	Acceptance (KIMS-AWJ)	Voices Acceptance (VAAS)	Voices Action (VAAS)
#1	-1.10	-1.04	-0.84	-0.76	-1.36	0	1.09	0.39
#2	-0.28	-0.23	1.26	1.89	2.49*	-0.23	1.27	1.75
#3	0	-0.57	-0.84	-2.08*	0.91	-1.14	-0.72	2.14*
#4	-0.55	1.81	-1.47	-4.35*	-6.80*	-3.89*	-0.18	-0.20
#5	0	-0.40	-1.68	-2.84*	-0.91	1.37	0.36	0.78
#6	0	-0.80	-0.20	-0.38	0	-2.75*	-0.18	1.56
#7	-0.28	0.26	2.10*	-0.19	-0.45	-1.60	-1.09	-2.53*
#8	0.28	0.80	-0.84	0.57	-1.36	-1.83	-1.81	-1.75
			1 worsened	3 imprd	1 worsened 1 improved	2 improved		1 wrsned 1 imprvd

*= significant at p<.05
NB a positive score represents deterioration, and a negative score an improvement

Changes within the Intervention phase of the study

Table 6.10 shows the reliable changes for participants during the whole Intervention phase of the study (the 10 sessions following the baseline phase).

One participant showed a reliable deterioration at the end of the intervention phase (Participant 2, anxiety symptoms).

Five participants showed reliable improvements post the intervention: Participant 3 experienced a reliable reduction in the severity of auditory hallucinations; Participant 4 had improved scores for depressive and anxiety symptoms, as well as quality of life; Participant 5 showed an improvement in anxiety symptoms; Participant 7 had improvements in severity of auditory hallucinations, anxiety symptoms and quality of life; and Participant 8 had improvement in quality of life.

There were also reliable, positive differences in the process measures, with Participants 4, 7 and 8 reporting greater non-judgemental acceptance and independent action from voices. In addition Participant 7 reported greater acceptance of voices.

Table 6.10 - Reliable Change Indices for Phases, End of Baseline - End of Therapy

Pt	Voice Symptom Levels (PSYRATS)	Social Functioning (SFS)	Depression (BDI-II)	Anxiety (BAI)	Quality of Life (MANSA)	Acceptance (KIMS-AWJ)	Voices Accept (VAAS)	Voices Action (VAAS)
#1	-0.28	-1.15	0.72	0	-0.45	-1.37	0	-0.18
#2	0	-1.44	-0.54	2.27*	0.46	-0.45	0.72	-0.37
#3	-2.20*	-0.43	0	-0.76	-1.36	-0.46	-0.72	-0.74
#4	-0.55	-0.04	-3.60*	-2.84*	-4.99*	-2.97*	-1.63	-2.23*
#5	-0.55	-0.68	-1.80	-4.17*	-0.45	0	-0.54	-0.37
#6	1.10	-1.18	-1.26	0.76	-0.91	-0.46	-0.72	0.37-
#7	-3.85*	-0.89	-1.26	-4.35*	-3.85*	-3.89*	-2.71*	-2.97*
#8	-1.37	-0.28	-1.44	-0.78	-3.63*	-2.74*	-1.81	-2.04*
	2 improved		1 improved	3 imprvd 1 wrsnd	3 imprvd	3 imprvd	1 imprvd	3 imprv.

*= significant at p<.05
NB a positive score represents deterioration, and a negative score an improvement

6.4.4 Summary of Changes during study

Table 6.11 summarises the changes across the phases of the study, indicating reliable improvements and deteriorations in the outcome and process variables.

In the Baseline phase only three participants showed a stable trend in their outcome measures (Participants 1, 3 and 6). Two participants appeared to have a deteriorating trend (Participants 4 and 5), while three participants had changes that appear to be an improving trend (Participants 2, 7 and 8). There were no changes in the process measures that represented a deterioration; for Participant 7 there was a reliable improvement in the level of acceptance of voices.

Table 6.11 - Summary of reliable changes by phases

Participant	Baseline (Start Baseline – End Baseline)	End Baseline-Mid Therapy	Post Intervention (End Baseline-End Therapy)
#1			
#2	↓ Depression ↓ Anxiety	↓ Quality of Life	↑ Anxiety
#3		↓ Anxiety ↑ Voices Action*	↓ Voice Symptom Levels
#4	↑ Depression ↓ Quality of Life	↓ Anxiety ↑ Quality of Life ↑ Non-judgemental Acceptance*	↓ Depression ↓ Anxiety ↑ Quality of Life ↑Non-judgemental Acceptance* ↑ voices Action*
#5	↑ Anxiety	↓ Anxiety	↓ Anxiety
#6		↑ Non-judgemental Acceptance*	
#7	↓ Voice Symptom Levels ↓ Depression ↑ Quality of Life ↑Non-judgemental Acceptance*	↑ Depression ↑ Voices Action*	↓ Voice Symptom Levels ↓ Anxiety ↑ Quality of Life ↑Non-judgemental Acceptance* ↑ Voices acceptance* ↑ Voices Action*
#8	↓ Depression ↓ Anxiety ↑ Quality of Life		↑ Quality of Life ↑Non-judgemental Acceptance* ↑ voice Action*

* process measures

6.4.4.1 Defining "responders" to the intervention

Based upon the RCI results five participants (3, 4, 5, 7 & 8) were classed as *responders* to the intervention, as there had been an improvement on at least one outcome measure between the end of the baseline phase and the end of the intervention. As can be seen in Table 6.10, for Participant 3 there had been a reliable reduction in the severity of his auditory hallucinations. Participant 4 there were reliable improvements on levels of depressive and anxiety symptoms, as well as quality of life. Participant 5 had improvement in anxiety symptoms only. Participant 7 had improvements in levels of anxiety symptoms and quality of life. Participant 8 had improvement in quality of life only.

It can also be observed that four of these five participants had clinical improvements accompanied also by improvements in levels of non-judgemental acceptance, acceptance of voices and/or independent action from voices. At the mid therapy point Participant 3 displayed an improvement in independent action from voices (and reduced anxiety), although this improvement was not sustained at the end of therapy. At the end of therapy Participants 4, 7 and 8 had improvements with non-judgemental acceptance and autonomy from voices, with Participant 7 also showing an improvement in acceptance of voices. For the purpose of analysis we decided to class these four participants as "*mindful-responders*".

Participant 2 demonstrated a reliable worsening following the intervention, with a deterioration of levels of anxiety.

As can be seen from Table 6.11, there were no participants who had reliable changes on non-judgemental acceptance, acceptance of voices or greater independent action from voices at the end of therapy, without changes in at least one outcome variable.

6.4.5 Outcome and process measures: Group level

In order to establish whether there were significant group-level changes in the outcome and process measures, analyses were conducted using the Wilcoxon Signed Rank Test, with a significance level set at $p < .05$. Comparisons were made between scores for the Start of Baseline -End of Baseline (to establish whether there was a stable baseline phase), End of Baseline- Mid Therapy (to ascertain changes during this period), and the End of Baseline -End

Therapy (to ascertain changes following the 10 session ACT intervention). These results are reported in Table 6.12 below.

Table 6.12 - Wilcoxon Signed Rank Test – Reported Significances for Study 2 outcome and process variables

Phase	BDI	BAI	MANSA	Acceptance without Judgement	Voices - Acceptance	Voices - Action	PSYRATS - Total	SFS
Start Baseline – End Baseline	.176	.362	.207	.482	.170	.058	.673	.575
End Baseline – Mid Therapy	.48	.161	.351	.063	.726	.624	.054	.779
End Baseline – End Therapy	.042*	.173	.024*	.017*	.061	.035*	.139	.012*

$p < .05$

It can be seen from Table 6.12 that there were no significant differences for the outcome and process variables in both the Start of Baseline-End Baseline and End Baseline-Mid Therapy comparisons. In contrast significant differences were found between End Baseline-End Therapy for five out of the eight variables, with only levels of anxiety (BAI), voices acceptance (VAAS) and the severity of auditory hallucinations (PSYRATS total) remaining unchanged. These differences suggest that there were significant sample-level increases following the ACT intervention in social functioning and quality of life, and a decrease in depressive symptoms. Similarly there were significant increases following the ACT intervention for the process variables of non-judgemental acceptance (KIMS-AWJ) and independent action from voices (VAAS).

6.4.6 Session ratings: Single Case analyses (Tau-u)

The graphs for the session measures of each participant appear in Appendix B-8.

The results of the Tau-u analysis appear in Table 6.13. As can be seen from this table, several participants' scores showed significant positive changes from the Baseline to Intervention phase. There were no significant deteriorations demonstrated with the session measures for any participant. Participants 2, 4, 5 and 7 showed significant changes in the reporting of distress associated with the voices; Participants 1 and 5 had significant reductions in their level of preoccupation with voices; Participant 7 also reported significant reductions in voice frequency and believability. One participant (5) had a significant (statistical) improvement on willingness, although visual inspection of the session ratings (see Appendix B-8) shows that the magnitude of change in the ratings was small (baseline range 0-2/100; intervention range 2-5/ 100).

Table 6.13 Phase A (Baseline) - Phase B (Therapy): Significant and trend level Tau-u analyses

Participant	Distress	Preoccupation	Frequency	Conviction	Willingness	Autonomy
#1	-	-0.750 CI -1.383, -0.117 p < .05	-	-	-	-
#2	-.667 CI -1.232, -0.101 P < .05	-	-	-	-	0.517 CI -.004, 1.037 P < .10
#3	-	-	-	-	-	-
#4	-0.736 CI -1.224, -0.248 p < .01	-	-	-	-	-
Group 2						
#5	-0.972 CI -1.61, -0.339 p < .01	-1.028 CI -1.661, -0.395 p < .001	-	-	0.912 CI 0.284, 1.55 p < .02	-
#6	-	-	-	-	-	-
#7	-0.750 CI -1.270, -0.230 p < .02	-	-0.800 CI -1.320, -0.280 p < .001	-0.767 CI -1.287, -0.246 p < .02	-	-
#8	-	-	-	-	-	-

Confidence intervals at 90%

For Distress, Preoccupation, Frequency and Conviction negative Tau-u values indicate improvements.
For Willingness and Autonomy positive Tau-u values indicate improvements. .

6.4.7 Session Ratings: Group Level (Tau-u Omnibus)

Below are Figures 6.3 to 6.8, which display the Tau-u analyses for the session ratings by participant, in addition to the omnibus Tau-u (90% confidence intervals).

The omnibus scores for the Tau-u suggest that there were significant group-level effects following the intervention for improvements in ratings of voice-related distress ($Tau\text{-}u^{group}$ = -.41, p < .0001, 90% CI [-0.60, -0.21]), preoccupation with voices ($Tau\text{-}u^{group}$ = -.30, p = .02, 90% CI [-0.51, -0.12]), and reductions in voice frequency ($Tau\text{-}u^{group}$ = -.36, p = .01, 90% CI [-0.55, -0.16]). Significant effects were not found post-intervention for autonomy from voices ($Tau\text{-}u^{group}$ = -.07, p = .54, 90% CI [-0.27, 0.12]), willingness ($Tau\text{-}u^{group}$ = .08, p = .45, 90% CI [-0.11, 0.29]), or conviction/ believability ($Tau\text{-}u^{group}$ = -.20, p = .12, 90% CI [-0.41, 0.02]).

Figure 6.3 Tau-u results for Voice Distress scores by participant and for group (omnibus score)

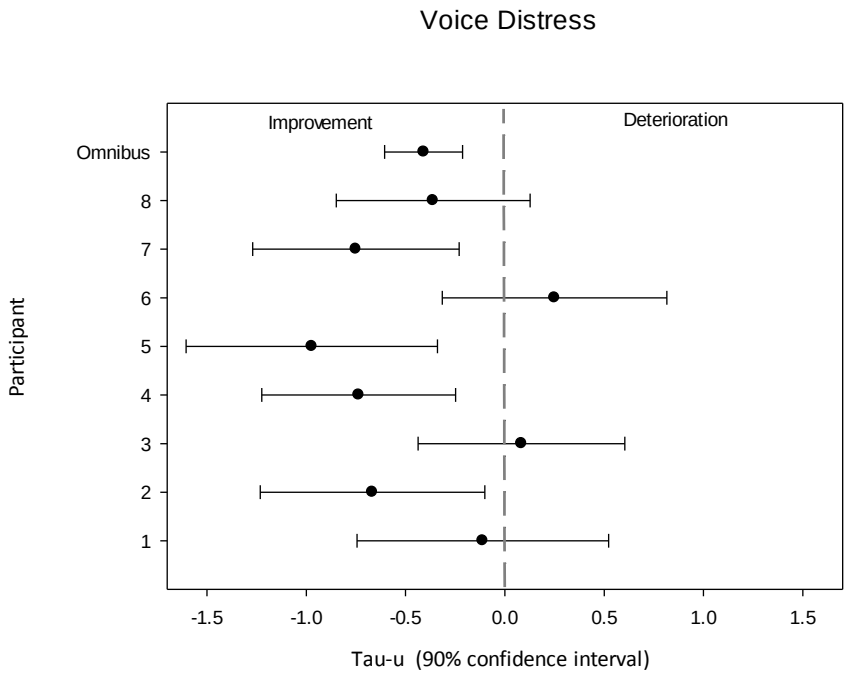


Figure 6.4 Tau-u results for Preoccupation with Voices scores by participant and for group (omnibus score)

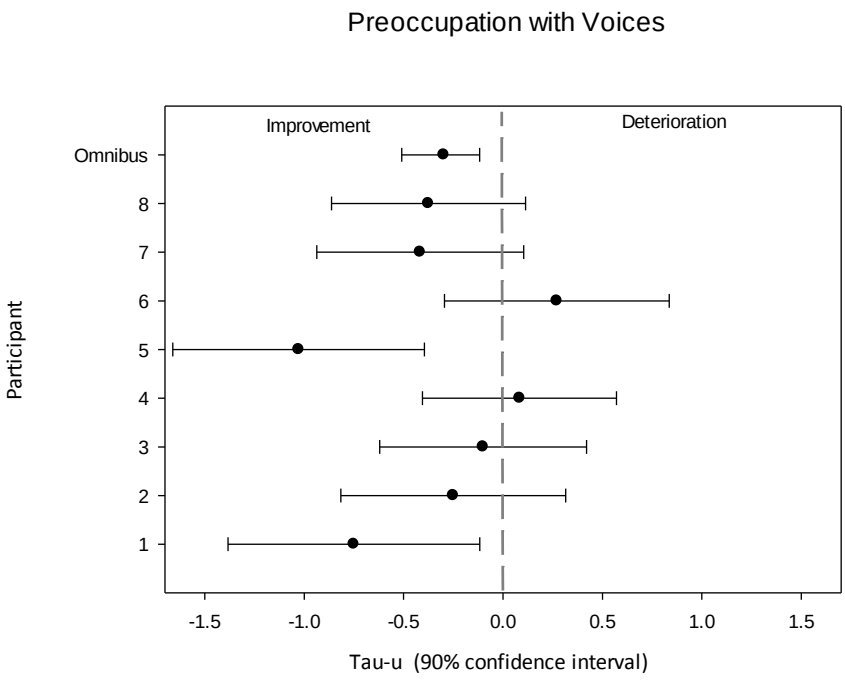


Figure 6.5 Tau-u results for Voice Frequency scores by participant and for group (omnibus score)

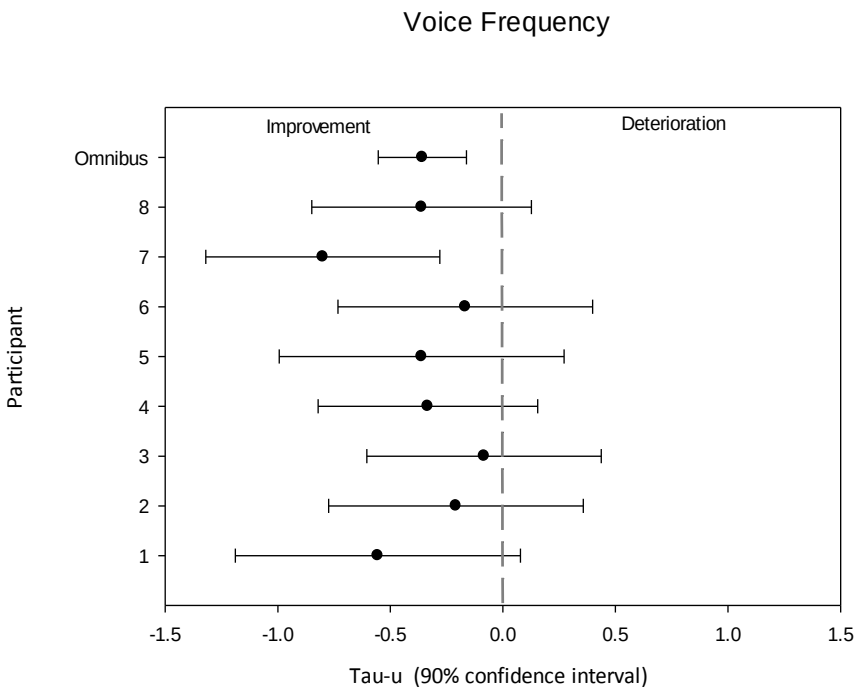


Figure 6.6 Tau-u results for Conviction/ Believability scores by participant and for group (omnibus score)

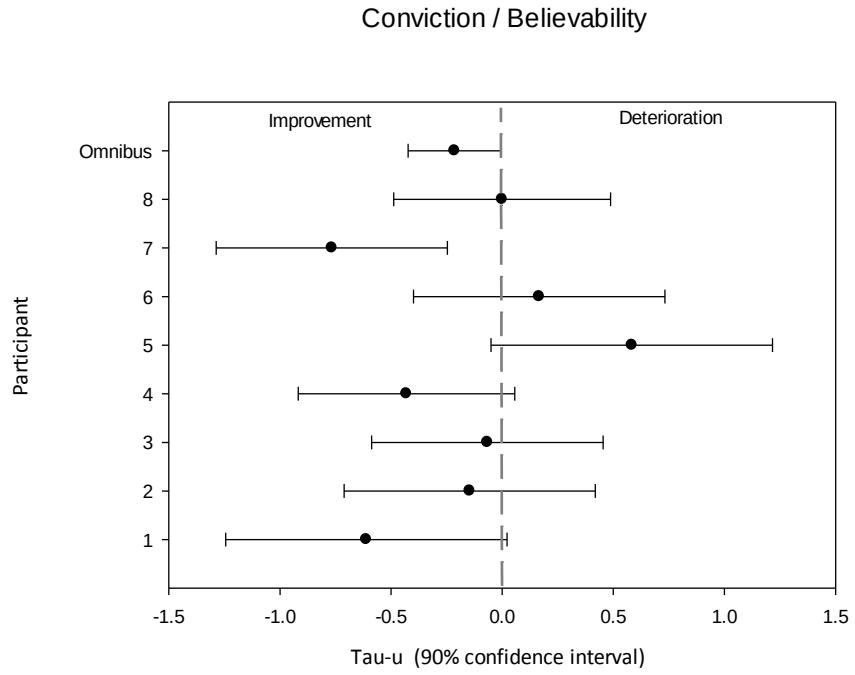


Figure 6.7 Tau-u results for Autonomy from Voices scores by participant and for group (omnibus score)

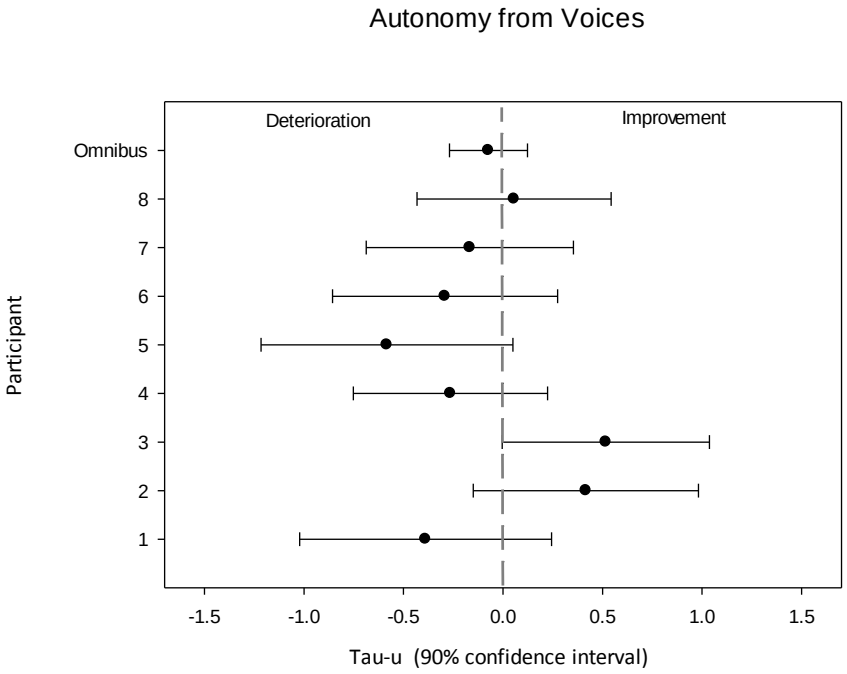
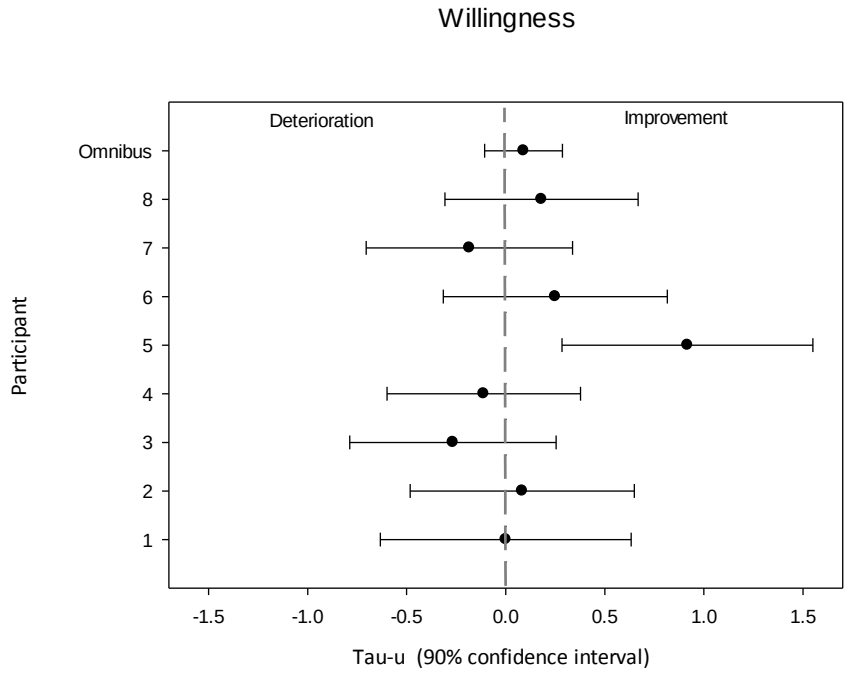


Figure 6.8 Tau-u results for Willingness scores by participant and for group (omnibus score)



6.4.8 Combined significant changes in study measures and session ratings

Listed in Table 6.16 are the combined significant changes on the study process and outcome measures.

Table 6.14 - Participant Significant Changes by Phases

Participant	Start Baseline - End Baseline RCI ($p < .05$)	End Baseline- Mid Therapy RCI ($p < .05$)	End Baseline- End Therapy RCI ($p < .05$)	Session Measure Changes (A/B) Tau-u ($p < .05$)
#1				↓ Preoccupation
#2	↓ Depression ↓ Anxiety	↓ Quality of Life	↑ Anxiety	↓ Distress
#3		↓ Anxiety ↑ Voices Action*	↓ Voice Symptom Levels	
#4	↑ Depression ↓ Quality of Life	↓ Anxiety ↑ Quality of Life ↑ Non-judgemental Acceptance*	↓ Depression ↓ Anxiety ↑ Quality of Life ↑ Non-judgemental Acceptance* ↑ voices Action*	↓ Distress
#5	↑ Anxiety	↓ Anxiety	↓ Anxiety	↓ Distress ↓ Preoccupation ↑ Willingness*
#6		↑ Non-judgemental Acceptance*		
#7	↓ Voice Symptom Levels ↓ Depression ↑ Quality of Life ↑ Non-judgemental Acceptance*	↑ Depression ↑ Voices Action*	↓ Voice Symptom Levels ↓ Anxiety ↑ Quality of Life ↑ Non-judgemental Acceptance* ↑ Voices acceptance* ↑ Voices Action*	↓ Distress ↓ Frequency ↓ Conviction
#8	↓ Depression ↓ Anxiety ↑ Quality of Life		↑ Quality of Life ↑ Non-judgemental Acceptance* ↑ voice Action*	
Summary	3 improved 2 worsened	3 improved 2 worsened	5 improved 1 worsened	5 improved 0 worsened

6.4.9 Relational Responding: Single Case analyses (D^{IRAP})

Tables 6.15 and 6.16 show the IRAP performance for each participant, across the study phases. The D^{IRAP}scores can be interpreted in this manner: a negative score suggests a preference toward non-acceptance and voices, while a positive score suggests a preference toward acceptance.

The majority of the participants produced negative D^{IRAP}scores throughout the study, suggesting stability in their relational responding, toward non-acceptance of voices. However, it can be observed that there were three participants who at the Start Baseline phase had a positive D^{IRAP}score (participants 4, 6 & 7); there were also positive D^{IRAP}scores suggestive of a preference toward acceptance at End Baseline (participants 1, 7), Mid Therapy (participant 7), and End Therapy (participants 1, 7).

Table 6.15 – IRAP Mean latencies and effect scores for Start and End Baseline Phases

Pt	Start Baseline Acceptance Mean latency (s)	Non-Acceptance Mean latency (s)	Pooled SD	D^{IRAP} difference	End Baseline Acceptance Mean latency (s)	Non-Acceptance Mean latency (s)	Pooled SD	D^{IRAP} difference
1	5.132	4.678	2.005	-0.23	4.321	5.051	1.680	0.43
2	5.415	4.918	1.725	-0.29	4.373	3.616	1.364	-.56
3	4.262	3.290	2.235	-0.44	4.066	3.148	1.478	-0.62
4	3.458	4.440	2.057	0.48	4.532	3.898	2.289	-0.28
5	5.384	3.188	2.200	-0.99	5.209	3.782	2.141	-0.67
6	2.566	2.582	0.860	0.02	3.189	2.797	0.906	-0.43
7	2.022	2.583	1.375	0.41	2.452	2.510	1.180	0.05
8	4.740	4.533	1.588	-0.13	5.634	4.642	2.099	-0.47

Table 6.16 - IRAP Mean latencies and effect scores for Mid- and End Therapy Phases

Pt	Mid Therapy **Acceptance Mean latency (s)**	**Non-Acceptance Mean latency (s)**	**Pooled SD**	**D^{IRAP} difference**	End Therapy **Acceptance Mean latency (s)**	**Non-Acceptance Mean latency (s)**	**Pooled SD**	**D^{IRAP} difference**
1	4.305	3.904	1.448	-0.28	4.030	4.549	1.656	0.31
2	4.740	3.979	1.672	-0.46	3.847	3.593	1.454	-0.17
3	3.994	3.000	1.536	-0.65	3.876	3.453	1.563	-0.27
4	3.708	3.100	2.127	-0.29	3.082	2.831	1.208	-0.21
5	4.313	3.503	1.918	-0.42	5.474	3.342	2.155	-0.99
6	2.333	1.849	0.873	-0.55	2.505	2.429	0.705	-0.11
7	1.181	1.929	0.880	0.84	0.833	1.130	0.570	0.52
8	3.895	2.719	1.227	-0.96	4.726	3.423	1.790	-0.73

6.4.10 Relational Responding: Group Level Analysis (Average D^{IRAP} scores)

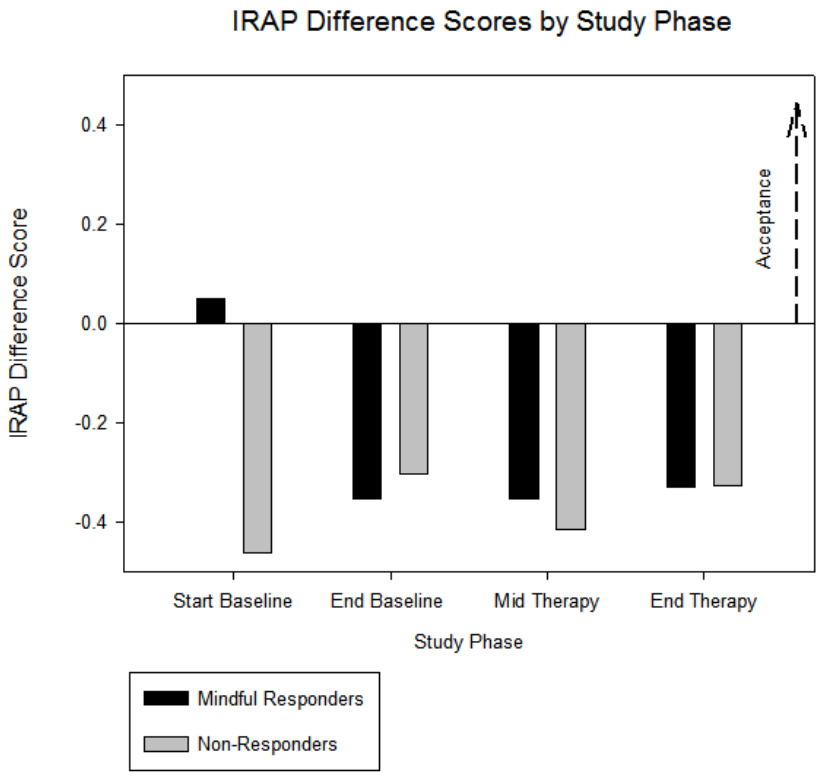
Table 6.19 shows the mean D^{IRAP} scores for the participants grouped as “mindful responders” due to their performance on the study outcome and process measures (participants 3, 4, 7 and 8; see above), compared to other participants (”non-responders”, N = 4). It can be seen that there was a clear difference between the mindful responders and the other participants at the Start Baseline phase, with the mindful responders as a group showing small preference for acceptance in the context of voices; this difference was not present in subsequent phases, with a group preference toward non-acceptance and equivalent performance to the non-responders. The “non-responders” as a group showed a preference for non-acceptance in the context of voices through all the study phases. Based on the individual performance shown in Table 6.17, it can be seen that for the Start Baseline phase the aggregated D^{IRAP} score direction is due to the responding of Participants 4 and 7. These scores are also demonstrated in graph form in Figure 6.9.

Table 6.17 – Mean D^{IRAP} difference scores across phases, Mindful Responders and Non-Responders

Group	Start Baseline	End Baseline	Mid Therapy	End Therapy
Non-responders	-0.46	-0.30	-0.42	-0.33
Mindful Responders*	0.05	-0.35	-0.35	-0.33

*Mindful Responders = Participants 3, 4, 7 & 8.

Figure 6.9 Mean D^{IRAP} difference scores across phases, Mindful Responders and Non-Responders



6.4.10.1 Practice effects for the IRAP

Table 6.18 compares at a group level the speed of responding to IRAP consistent and inconsistent trials across the phases of the study. This comparison was conducted using the Wilcoxon Sign-Rank test (a non-parametric test due to the small N) and demonstrates that for both types of trials that there was a significant difference in speed of responding when comparing performance at the Start Baseline phase with the End Therapy phase. Moreover, it appears that there was significant reduction in response latency for Inconsistent trials at the Mid Therapy phase, when compared to the End Baseline phase. These results suggest that for the sample there was a significant, overall increase in speed of responding from the start of the study to the end, suggestive of a practice effect.

Table 6.18 - Practice Effects for IRAP - Wilcoxon Signed Rank Test, Reported Significances

Phase comparison	Consistent trials	Inconsistent trials
Start Baseline – End Baseline	.674	.674
End Baseline – Mid Therapy	.093	.036*
Mid Therapy – End Therapy	1.00	.779
Start Baseline – End Therapy	.036*	.036*

6.4.11 Therapy Generalization: Untargeted Gains

A therapy model based upon behavioural principles suggests that a common process of change that occurs during an effective intervention is a greater proportion of actions based upon approach (appetitive control) rather than escape (aversive control) (Hayes, Strosahl & Wilson, 2012). Although this process was not formally measured in this study, there were participant reports during the intervention that were suggestive of this process occurring. In Table 6.19 below are participants' reports about engaging in previously-avoided activities that were described as being part of ongoing, chosen life directions and associated with a personal sense of meaning. It was of note that these actions were not targeted during the therapy sessions; rather the participants decided to engage in these activities without suggestion or prompting from the therapist.

The uncontrolled, anecdotal nature of these reports of course limits the validity of the conclusions that can be drawn. Rather these observations may provide some suggestion to measuring idiosyncratic processes of change specified within the ACT model not otherwise targeted by current measurement methods.

Table 6.19 Untargeted Gains during the Therapy Phase

Participant	Action
#1	Participant decided to go to an ceremony to receive an award for 10 years' volunteering
#2	Participant decided to walk past a petrol station, on the way to the clinic, to exercise openness to his experiences (trauma cue)
#5	Participant engaged back in competitive chess and political activism, after long break following onset of illness.
#6	Participant chose to take long bus journey to get to relative's birthday party, in the face of paranoid thoughts and voices.

6.4.12 Summary of results

Were the study hypotheses supported?

The results of the single-case and group levels of analysis were used to determine the support for the study predictions.

1) *Reliable changes in certain outcome measures (levels of depression and anxiety symptoms, social functioning and quality of life) will only occur in the intervention phase. It is not expected that there will be reliable changes in outcomes following the baseline phase of the study.*

At the single-case level this prediction was not supported: during the baseline phase several participants showed reliable improvements in outcome measures, such as depression (Participants 2, 7 and 8), anxiety symptoms (Participants 2 and 8), and quality of life (Participants 7 and 8). Several participants also showed reliable deteriorations in depression (Participant 4), anxiety (Participant 5), and quality of life (Participant 4).

For the four participants that showed a reliable improvement in these outcome measures at the end of the intervention, when compared to the end of baseline, two of them (Participants 7 and 8) were showing improvements in levels of depressive and anxiety symptoms during baseline phase (suggestive of a trend toward improvement). However the other two participants (4 and 5) were showing deterioration in levels of depression or anxiety symptoms, respectively, before improvements in the intervention phase.

At the group level this prediction was supported: there were no significant changes on outcome measures during the Baseline phases. In the Intervention phase there were only significant improvements in certain outcome measures (depression, quality of life, social functioning) at the End Therapy assessment point. There were no significant improvements demonstrated for levels of anxiety symptoms or auditory hallucination severity at the group level.

In addition, for the session ratings at the group level, significant changes were found for distress associated with voices, level of preoccupation with voices, and voice frequency.

2) *Significant changes in process measures (psychological flexibility, non-judgemental acceptance, believability, willingness toward voices, autonomy from voices) will occur only when the intervention phase is commenced.*

At the single-case level this hypothesis was partially supported in this sample: for those participants that demonstrated significant change on the process variables, this largely occurred during the intervention phase. The only exception to this was Participant 7, who had a significant, positive change in non-judgemental acceptance during the baseline phase.

This hypothesis was supported when looking at changes in process measures at group level: significant changes in levels of non-judgemental acceptance and independent action from voices were observed at the end of intervention phase. There was no significant change for believability/ conviction, acceptance of voices, willingness or autonomy from voices however.

3) *Significant changes in process measures will precede changes in outcome measures (i.e. for responders Mid Therapy assessments will show process changes, while significant outcome measure changes will be evident at End Therapy).*

Contrary to the prediction, significant changes in the process measures did not precede changes in the outcome measures (i.e., at the Mid Therapy assessment point). Thus at the group level there are concomitant changes in process and outcome measures, but no preceding process changes that could imply causality. It may be that improvements in levels of depression, anxiety and quality of life led to improvements in non-judgemental acceptance and independent action from voices, rather than the other way round, as had been predicted.

4) *It is not expected that outcome changes will be concomitant with processes not directly targeted by ACT: frequency of symptoms, reductions in auditory hallucination symptom severity.*

This prediction was partially supported at the single-case level: the majority of participants who experienced improvements in outcome measures at the end of therapy did not experience significant changes in the severity of auditory hallucinations (PSYRATS) or frequency of voices (session ratings). The exceptions were Participants 3 and 7: Participant 3 had a reliably reduced PSYRATS score at the End Therapy assessment (but no other outcome improvements); Participant 7 had a reliably reduced PSYRATS score and a significant reduction in frequency of voices on session ratings, in addition to reliably improved outcomes (anxiety and quality of life).

At group level there was no significant reduction in auditory hallucination severity (PSYRATS), supporting the prediction.

However, within the session ratings, a significant group effect was found for reductions in the reported frequency of voices following the intervention.

5) *Exploratory analyses of I relational responding (IRAP)*

The results of the participants' IRAP performance suggest that the majority of the participants responded in manner consistent with preferring non-accepting coping toward voices. However, the four participants who subsequently responded to the ACT intervention with outcome and process improvements demonstrated a different pattern as a group to the non-responders, suggestive of a pre-intervention response style that preferred acceptance toward

voices. However, over the subsequent phases and at the End Therapy relational responding appeared to be consistently (for all participants) in the direction of non-acceptance of voices.

6.5 Discussion

In this study it was found that a group of eight distressed voice hearers showed improved outcomes in depression, quality of life and social functioning after participating in 10 individual sessions of acceptance and commitment therapy, when compared with a randomized baseline period of three to six weeks of contact with a therapist but no active intervention. Improvements in distress, quality of life, and functioning, were concomitant with positive changes in psychological flexibility toward voices (voice acceptance) and non-judgemental acceptance. In addition there were group-level changes in level of preoccupation and distress with voices, as well as reported voice frequency. Consistent with the Psychological Flexibility Model changes in levels of psychological flexibility toward voices (values-based actions, rather than being guided by voices) and non-judgemental acceptance were associated with the introduction of the ACT intervention; these changes did not occur through contact with the researcher, during the baseline phase. Qualitative reports by participants of willingly engaging in activities associated with greater distress, without direct focus in therapy, are suggestive of the processes described in the Psychological Flexibility Model.

The results of single-case analyses provide partial support of the study hypotheses: reliable changes in outcomes and process measures were not exclusive to the intervention phase for participants (discussed below); when positive baseline trend was controlled for in statistical analyses (i.e., Tau-u), significant intervention effects were found in single cases for levels of distress, preoccupation, conviction and voice frequency. Within this study there were no indications of changes in psychological flexibility preceding changes in outcomes; it may be that the assessment points were too few to adequately measure this process (if it was there); it could also be that changes in psychological flexibility co-occur with changes in anxiety or depression.

Contrary to the study predictions ACT was not associated with positive changes in believability/ conviction, acceptance and willingness to experience voices, or session ratings of greater autonomy from voices. One possibility is that believability, measured in a way

consistent with measuring conviction (e.g., Chadwick & Lowe, 1994; Haddock et al., 1999) was inconsistent with the construct suggested by the Psychological Flexibility Model, which is a measure of the probability that actions are influenced by the appraisal of the voice (see discussion in Chapter 2, section 2.4.2.2, and (Farhall, Shawyer, Thomas & Morris, in press). Inspection of single-case data also found that several participants had internal explanations for their voices (e.g., as a symptom of mental illness) when assessed with the PSYRATS, scoring consistently at 0 for conviction in an external attribution for their experience of voices. At a group level this would have created a floor effect for how low conviction scores could have gone over the course of the study. For acceptance of voices as measured by the VAAS and the willingness item in the session ratings, it may be that this construct is also inconsistent with the Psychological Flexibility Model: for example, there are several items on the VAAS that ask people how much they "accept" hearing voices. As active acceptance in psychological flexibility terms is not about condoning or liking private experiences (Hayes, Strosahl & Wilson, 2012), it could be that participants respond to these items and the willingness question from that perspective, rather than the type of acceptance cultivated in ACT. Another possibility is that the ACT intervention in this study promoted non-judgemental awareness and independent action from voices, but was not as focused on acceptance of the voice as an experience (despite regular mindfulness and defusion exercises in-session). Future research may focus on refining the measurement of these constructs, as well as trying to capture some of the putative generalized changes suggested in the "non-targeted gains" section of the results: contextual measures of voice hearing and outcomes in psychosis are in the early stages of development (Ratcliff, Farhall & Shawyer, 2011).

6.5.1 Study Innovations

This study used a recent innovation in single-case research: the use of non-parametric statistics for continuous measures to determine significant change for single-cases, and an attempt at determining intervention effects across participants through omnibus statistics. This innovation was informed by the recent work to establish robust effect sizes in single-case research, to enable the results of small-N research to be used within meta-analyses (Parker & Hagan-Burke, 2007). In this study this statistical method allowed for conclusions to be drawn at the level of the group, an improvement over determining intervention effects across replications through visual analysis (see Parker & Brossart, 2003 for a discussion). The use of these new statistical methods may allow for single-case designs to better inform treatment

developments in cognitive behavioural therapies, as effects can be estimated across studies; small-N, low-cost research methodologies enhanced by statistical procedures may result in more rapid investigations of hypothesized processes.

The other measurement innovation used in this study was the relational responding measure, the IRAP. This pilot work of using implicit measurement was motivated by the author wanting to develop methodologies that may have advantages over self-report and interview, as the IRAP has been found to be less susceptible to social expectancies (Barnes-Holmes et al., 2011) or attempts to deliberately control or "fake" responses (McKenna et al., 2007). This study found that people with psychosis can produce valid IRAP responses (see the pilot development section earlier);. it was found that the IRAP performance for most participants in the first assessment was suggestive of non-acceptance toward voices, however there were also participants who displayed a preference toward acceptance. These participants subsequently showed reliable changes in psychological flexibility and non-judgemental acceptance, and improved outcomes, following ACT. This result could suggest that existing implicit beliefs towards acceptance of voices, as assessed by IRAP performance, may have predictive potential in identifying those who may benefit from ACT, although this is a highly speculative conclusion based on a small number of participants. Nevertheless, these results are consistent with findings from other types of psychological interventions: for instance Ross et al (2011) also found that response to a reasoning intervention was moderated by the presence of reasoning biases at baseline. However, the additional IRAP results limit the conclusions that can be drawn about this assessment method: over the course of the study participants' performance showed a preference toward non-acceptance of voices. This included those participants who had shown a preference toward acceptance in the first assessment. Additional analysis suggests that the IRAP performance in this study was also subject to practice effects.

Therefore, it is difficult to draw conclusions about the IRAP as an assessment method, as the results do not cohere with conclusions drawn from the other assessment methods used in this study (such as reliable increases in psychological flexibility and non-judgemental awareness; or qualitative descriptions by participants of the greater use of acceptance toward voices and other experiences). It may be that IRAP scores from the first assessment are spurious, and that the IRAP was not measuring the constructs that it was designed for (experiential avoidance or acceptance toward voices); it could also be that participants became more fluent at the IRAP task, particularly in providing responses that fit with experiential avoidance, and that this

performance is unrelated to the intervention outcomes. Further research using the IRAP could establish the construct validity of this measure for voice acceptance through a group-based design using self-report measures of voice acceptance and psychological flexibility, and associations with voice-hearing outcomes such as mood, distress, coping responses, and functioning. Recent developments with the IRAP have resulted in a task that may reduce the cognitive load and allow for better measurement of individual items (Levin, Hayes & Waltz, 2010); these improvements may lead to the IRAP having potential as a reliable measure in psychosis research.

6.5.2 Study Limitations

A limitation of this study was the selection of the participants: there was possibly a greater degree of heterogeneity (in terms of auditory hallucination dimensions, concurrent mood and anxiety, diagnosis) than could be supported by the research design in being able to draw conclusions from the data. This may, in part, have been a result of the recruitment process: despite the prevalence of persisting auditory hallucinations for those accessing secondary care mental health services, it was a challenge to recruit people in the study, through limited initial engagement or dropping out, or a mismatch between the expectations of what therapeutic method would be used, or the symptom elimination goals of participants, and what ACT could offer (see discussion of this in the Method section).

The small numbers used in this study, limits the conclusions that can be drawn regarding the generalized effectiveness of ACT for voices, although the use of a single-case experimental design has allowed for a systematic way to test hypotheses and deal with some of the threats to internal validity, and provides directions to assess processes using other designs.

The researcher acted as the therapist and assessor in this study, meaning that the assessments were not blind/ or independent. The use of statistical procedures and the IRAP measure were attempts to limit Type I errors and experimenter bias, however for future studies using this design it would be ideal to use a separate assessor to limit the effect of these biases.

Another limitation was that despite recruiting stable 'medication-resistant' service users, for some participants a stable baseline could not be established for certain outcomes (depression, anxiety and quality of life). It was the case that two of the participants showed a deterioration

in depression or anxiety during the baseline, which did not threaten the validity of the baseline, as the trend was in the opposite direction to the study predictions. However, there were also participants who displayed reliable improvements in the baseline, which may limit the conclusions about change following the introduction of ACT. For other outcomes, there was greater stability during the baseline: social functioning did not reliably change for any participants, and the severity of auditory hallucinations was stable for all participants, aside from one. Thus, at least for two participants, the possibility that improvements were due to non-specific factors (e.g., the introduction of regular social contact with the ACT therapist, positive expectations about therapy), cannot be ruled out. An observation that limits the conclusion that the baseline phase had general, consistent factors that improved outcomes is that several participants showed deterioration in this phase, and the others displayed no reliable change from the first assessment.

Finally a serious limitation was being unable to conduct a follow-up assessment at a 3 month or later time period to assess the long-term impact of the intervention. This was due to the nature of the recruitment of the participants: all participants were on waiting lists for cognitive behavioural therapy and commenced this following the study. Thus there would have been a confound if a follow-up assessment had occurred. This was unfortunate, as other ACT for psychosis studies have suggested that there are sustained and increasing improvements following the end of intervention (Bach, Hayes & Gallup, 2011; Gaudiano et al., 2012; White et al., 2011).

6.6 Summary

This study investigated changes in outcomes and process variables following ACT for people experiencing distressing and disabling auditory hallucinations. The results suggest that changes in levels of non-judgemental acceptance and psychological flexibility (independent action from voices) were associated with, but did not occur prior to, improvements in levels of depressive symptoms, social functioning and quality of life, for the participants who responded to the ACT intervention.

Efforts to measure changes in implicit responding to experiential avoidance and willingness words in relation to voice hearing suggested that, for those who responded to the ACT

intervention, there may be a predictive value in measuring relational responding However, these results are speculative, due to the small-N of this study. In addition, subsequent assessments call into question the validity of the implicit assessment procedure in this study.

This study highlights the need for future research to focus on developing adequate measures of the constructs from the Psychological Flexibility Model, particularly relevant to the context of experiencing auditory hallucinations. This includes refinement of measures of believability and acceptance of voices as private experiences.

Chapter 7

Study 3 - A comparison of acceptance, reappraisal and suppression instructions in coping with an analogue of auditory hallucinations in a healthy sample.

7.1 Abstract

This study investigated healthy participants' responses to a simulation of auditory verbal hallucinations in an experimental paradigm. Participants were randomised to one of three conditions, which consisted of being trained to respond with acceptance, reappraisal or suppression. Differences in ratings of the experience of, and response to, the simulated auditory verbal hallucinations were compared across the experimental groups. In addition the relation of several potential moderating variables to the study dependent variables was investigated.

One hundred and ten healthy participants were recruited to the experiment. The results demonstrated that there were no significant differences between the three groups on post-task ratings of the simulated hallucinations unpleasantness, intrusiveness, or believability of voices' statements, or personal sense of control during the task; similarly there was no difference in a behavioural measure of controlling the voices. In addition analyses of covariance did not detect any significant associations between psychological flexibility, non-judgemental awareness, conscientiousness and psychosis proneness, and the dependent variables.Post hoc analyses of the sub-sample of participants who adhered to the experiment instructions were suggestive of equivalent, superior effects for reappraisal and acceptance over the use of suppression in terms of reduced ratings of unpleasantness, intrusiveness and believability; this analysis also suggests reappraisal potentially is superior to both suppression and acceptance in fostering a greater personal sense of control over simulated hallucinations. Potential methodological and measurement limitations of the study are discussed.

7.2 Introduction

As described in Chapter 4 experimental analogues of acceptance have been conducted across a range of different challenges, and with comparisons to control and active regulation methods, such as suppression and reappraisal.

Several different effects have been identified for regulation methods, including whether a particular strategy is associated with: changes in the intensity of physical pain and affect, and levels of arousal; increases or reductions in tolerance to challenging stimuli, or with behavioural task persistence while in contact with such stimuli (both typically measured by how long a participant chooses to stay in contact with aversive stimuli, and whether they tolerate repeated exposure to stimuli); and whether the believability of challenging stimuli are altered (e.g., avoidance functions reduced or potentiated; the perception of how distressing aversive stimuli are).

These studies are consistent on the effects of suppression – that it is likely to be an ineffective method for coping with challenges, and produces comparative increases in physiological arousal (e.g., Gross, 1998), rebound effects in target thoughts (e.g., Wegner and Wenzlaff, 1996), and reduced task persistence and distress tolerance (e.g., Feldner et al., 2003).

In contrast, studies of the effects of reappraisal suggest that this does reduce distress and arousal during psychological challenges (Schartau, Dalgleish & Dunn, 2009), however, there are inconsistent findings on whether this strategy positively influences task persistence or tolerance, particularly when compared to acceptance (e.g., Szasz, Szentagota & Hofmann, 2011, 2012; Perry et al., 2012; Wolgast et al., 2011).

Finally, as discussed in Chapter 4, the results of experiments with an acceptance condition suggest that this may be a more effective strategy for distress reduction, compared to distraction or suppression, in challenges that involve prolonged exposure to stimuli that elicit strong physiological responses (e.g., Keogh et al., 2005) but not necessarily for challenges that involve brief pain or distress (e.g, Paez-Blarrina, 2008; Kuehner, Huffziger & Liebsch, 2009); while this training may not influence levels of distress in response to aversive stimuli there may be comparatively less believability/ fusion with the experience (Gutiérrez et al., 2004;

Paez-Blarrina, 2008) and comparatively greater task persistence and tolerance (e.g., McMullen et al., 2008).

As described in Chapter 1, studies of naturalistic coping of people with schizophrenia who have auditory hallucinations suggest that suppression is a commonly used coping strategy, however efforts focused on suppressing this experience are associated with poorer functioning and greater distress (Badcock, Paulik and Maybery, 2011). It has been suggested that better adjustment, at least among those who are less distressed by voices, is associated with greater acceptance of auditory hallucinations as an experience (Romme & Escher, 1993; Farhall & Gehrke, 1997). There is a broader suggestion from the emotional regulation literature for schizophrenia that suggests that active acceptance is a comparatively underused skill in this population (Perry, Henry and Grisham, 2011). Finally, reappraisal of auditory hallucinations is a technique central to cognitive behavioural therapy approaches to helping people distressed by voices, while acceptance has been shown to be beneficial for a number of psychological problems, but has not been investigated with voices, particularly in an experimental study.

The purpose of this third study therefore was to compare the effects of these different strategies in coping with an analogue of auditory hallucinations in a healthy sample. Participants were asked to complete a task involving problem-solving while experiencing simulated auditory hallucinations distracting them from the task and commenting on their performance. Participants were trained to cope with the challenge though either: suppressing the experience, re-appraising the experience, or use a stance of active acceptance (flexibility responding to the experience, allowing it to be there without attempting to change its form or frequency). The associated perceptions of distress, intrusiveness and believability of the analogue auditory hallucinations were investigated, in addition to an appraisal of personal control over the voices, related to the allocated coping strategy. A behavioural measure assessing task persistence and tolerance was also included.

In addition, the role of a number of moderating variables on the study dependent variables was investigated. Based on previous studies the variables considered to potentially moderate the effect of the experimental instructions were: trait levels of mindfulness (Evans, Baer & Segerstrom, 2009) and psychological flexibility (Kashdan et al., 2006), current mood (Zelman et al., 1991), cognitive ability, trait use of emotion regulation strategies of reappraisal (Johnson et

al., 2011) and suppression (Gross, 1998), schizotypy (Henry et al., 2009), psychosis-proneness (Wout et al., 2004), and conscientiousness (Bartley & Roesch, 2011).

7.2.1 Research Questions and Hypotheses

1. In an analogue of auditory hallucinations, are there differences in distress, believability and tolerance, when healthy participants are trained to suppress, re-appraise, or actively accept the experience?

2. Are the effects of suppression, reappraisal and acceptance moderated by psychological flexibility, non-judgemental awareness, schizotypy, or habitual use of emotion regulation strategies?

7.2.2 Study Predictions

1) It is predicted that experimental instructions/training using acceptance processes will produce greater behavioural (task) persistence than training that involves suppression or reappraisal.

2) It is predicted that acceptance instructions will result in less intrusiveness and believability of the voices post-task, compared to either the suppression or reappraisal conditions.

3) It is predicted that the reappraisal condition will result in less distress, compared to both the suppression and acceptance conditions.

There were no predictions made for the moderating variables, instead these were subject to exploratory analyses.

7.3 Method

7.3.1 Ethical Considerations

This study received ethical approval in May 2011 from the Psychiatry, Nursing & Midwifery Research Ethics Sub-Committee, King's College London (REC reference: PNM/10/10/11-51). Please see Appendix C-1 for documentation.

7.3.2 Study Design

The study used a randomised, between-participants design, allocating participants randomly to three experimental conditions (acceptance, suppression and reappraisal). The independent variable was the allocated condition (3 levels), and the dependent variables were voice tolerance, unpleasantness, intrusiveness, believability, and sense of personal control.

To determine the required sample size a power calculation was conducted, based upon the effect sizes for acceptance analogues reported in (Gutiérrez et al., 2004 and Paez-Blarrina et al., 2008): three experimental conditions (alpha 0.05, power 0.8), with a predicted effect size of 0.30 (Cohen's *d*); resulted in an estimated N = 90, with 30 participants in each condition.

7.3.2.1 Construction of experimental paradigm

Simulated h*allucinations*

A literature search revealed that experimental analogues of auditory hallucinations were already available from studies investigating whether healthy participants' attitudes toward mental illness can be changed by taking part in simulations of auditory hallucinations. A common resource used for this purpose is the "Voices that are Distressing" training package developed by Deegan (1996), which involves listening through headphones to benign and derogatory voices typical of psychosis, while carrying out tasks. Other studies have used virtual reality environments (e.g., Banks et al., 2004) and goggle and headset hardware (see Ando, Clement, Barley & Thornicroft, 2011, for a review).

However for the current study it was decided to produce voices stimuli that were solely derogatory, to be aversive enough for healthy participants to need to use a coping strategy. Similar to the Deegan (1996) simulation, participants were asked to complete a task while experiencing the voices stimuli, to provide a greater chance of them finding the "voices" interfering.

Stimuli

The audio stimuli for the study were developed in several steps. The first step was deciding on the derogatory content of the voices, in the form of second-person, disparaging and worrying comments. Through discussion with two clinical experts in psychosis (PhD supervisors), in addition to the author's clinical experience in working with people with psychosis, a list of comments was produced. These comments were about the participant's task performance and self-concept, such as "You are failing at this task", "You cannot do it", "That was a mistake", and "You are a fool", "You are stupid", etc. In addition there were comments designed to evoke a sense of paranoia and suspiciousness, such as "Keep on guard, this experiment is a fake"," You are being set up to fail by the experimenter", etc. For ethical reasons content that may be personally offensive to the participants, such as profanities, was avoided. The comments used in this study are listed in Appendix C-2.

Both a male and a female voice were used, in English accents, to say the comments. Two volunteers were engaged in recording the comments, using several different tones of voice, including mocking and angry tones. These comments were recorded using a Zoom H2 sound recorder as .wav files. An audio clip of the voice sounds was produced using an audio editing program (Audacity: http://audacity.sourceforge.net/) combining the comments from the male and female voices. The audio clip was developed through several versions (reviewed by PhD supervisors), resulting in the voices having overlapping, repetitive comments, presented in a series of blocks, and superimposed over the sound of a crowd murmuring. Thus there were periods of time when the participant only heard murmuring before the voice sounds would commence again (ranging in intervals from 10 − 45 seconds). This was in order to reduce the predictability of when the comments would be heard, and to provide indistinguishable voice noises throughout the experiment.

Finally, two mental health service users who experienced persisting auditory hallucinations were consulted, after being informed about the purpose of the experiment. They listened to

the 10 minute recording, and were asked to rate how similar it was to their own experience of hearing voices (0-10), in addition to giving general feedback. The service users rated the voices stimuli as similar to their own experience (giving scores of 9 and 10), describing the similarities as: the critical content of the voices, the pacing, how the voices repeat each other, that there were male and female voices, and that the audio clip contained breaks in voices' comments, making it difficult to predict when the comments would recommence.

Components of Quality Analogues of Acceptance Protocols

Barnes-Holmes and Hayes (2005) have suggested a number of criteria for judging the quality of analogue studies using acceptance protocols; these recommendations were used to develop this study. Appendix C-3 lists the criteria and how this study addresses these.

7.3.2.2 Development of the experimental instructions

As described in Chapter 4, a review of the experimental literature on acceptance, reappraisal and suppression informed the form and elements of the coping instructions. Instructions for each condition were written with similar structure and length, and contained the same metaphor. Based on the studies by Gutiérrez et al. (2004), Keogh et al. (2007) and Páez-Blarrina et al. (2008), the ACT Swamp metaphor (Hayes, Strosahl & Wilson, 1999, p.248) was used as the central metaphor for each of the instructions, with the directions on how to cope with difficult experiences when pursuing a goal being consistent with the function of suppression, reappraisal or acceptance.

The instructions had the following common elements:

- Similar word length (Reappraisal: 612 words, Suppression: 616 words, Acceptance: 614 words) and duration of instruction (around 3 minutes 30 seconds)
- Use of similar phrases, where possible
- Same number of examples (three)
- A central metaphor (Swamp Metaphor)

The coping instructions are described in detail in Appendix C-4. The instructions were planned to be delivered by video clips, using the same trainer in each clip (see below for the Procedure).

To determine whether the instructions could be reliably discriminated as examples of reappraisal, acceptance and suppression, five research psychologists were asked to identify the coping instructions according to the following definitions:

> *Reappraisal – changing the way a situation is construed so as to decrease its emotional impact (Gross, 1998)*
>
> *Acceptance - the active and aware embrace of those private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm (Luoma, Hayes & Walser, 2007).*
>
> *Suppression – conscious inhibition of emotional expressive behavior while emotionally aroused (Gross & Levenson, 1993)*

The five research psychologists were sent the three sets of instructions, unlabelled and in different orders for each rater. The psychologists reached 100% agreement in categorising the instructions by type, and classified them consistent with intended function.

7.3.2.3 Experimental Task

Mazes were used as the distractor task, since they involve volition and planning (Lezak, Howieson & Loring, 2004). A set of printed mazes was prepared, to be completed by participants in the experiment, while listening to the voices stimuli. These mazes were sourced from a website (http://www.onebillionmazes.com/) and organised into a booklet of 16 mazes of progressive difficulty. Please refer to Appendix C-5 for examples of the mazes booklet pages.

7.3.3 Participants

Healthy, non-clinical volunteers were invited to participate in this study. Participants were healthy adults aged 18 and older, who met the study inclusion criteria: not currently having clinically significant symptoms of depression or anxiety, and not having experienced auditory hallucinations or psychosis in their lifetime (established by brief screening questions). Further exclusion criteria were poor hearing and insufficient mastery of English to comprehend task instructions.

One hundred and eleven participants were recruited from a King's College London email list and a research database of healthy participants (Mindsearch: www.kcl.ac.uk/iop/research/mindsearch). One participant withdrew their involvement following the experiment, leaving a final sample of 110 participants.

Participants' mean age was 24.5 years (*SD* = 5.9; range 18 - 50), with 32 males and 75 females. The sample was skewed toward those with a high level of education: 53.6% reported having an undergraduate qualification, 42.7% currently studying toward an undergraduate degree, 3.6% having completed secondary education but no further education. In terms of employment, 82.7% of the participants reported that they were in education or training, 5.5% in part-time employment, 10.9% in full-time employment, and 1 participant (0.9%) reported that they were unemployed. Participants' self-report ethnicity: 48.2% reported a White British or other White background, 9.1% a Mixed background, 37.2% an Asian/ Asian British background, 4.6% Black/ African/ Caribbean/ Black British, and 1 participant (0.9%) from Arab background.

7.3.4 Measures

The full questionnaires and scales used in this study appear in Appendix C-6.

Experiment Ratings

The dependent variables for this experiment were measured using the computer program. These were of two types:

1) Voice tolerance

Time until first voice control response - this was a measure of the number of seconds taken until the participant used the USB mouse (see below). This duration was measured by a timer in the computer program, which responded to the click of the mouse.

Number of voice control responses - a count of the number of USB mouse button presses, measured by the computer program.

2) Post-experiment ratings and queries

At the end of the experimental task the participant was asked to rate on the computer screen, using a visual analogue scale (0-10):

- How unpleasant the voices were
- How intrusive the voices were
- How true the voices comments seemed during the task [voice believability]
- How much control the participant felt they had over the voices during the task

Finally participants were asked to indicate whether they would be willing to do the experiment again (dichotomous, yes/no choice).

Potential covariates

Acceptance & Action Questionnaire-II (AAQ-2; Appendix A-2.1) - Please refer to Chapter 5 for a description of this scale (in the Measures section 5.3.4).

Acceptance without Judgement sub-scale of the Kentucky Inventory of Mindfulness Skills (KIMS-AWJ; Appendix B-6.4) - Please refer to Chapter 5 for a description of this scale (in the Measures section 5.3.4).

Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983; Appendix C-6.1) – this is a 14-item self-report screening scale, containing a 7-item sub-scale for anxiety and a 7-item sub-scale for depression. The HADS was developed for detecting states of anxiety and depression in non-psychiatric hospitals in adults between the ages of 16 and 65. Items are rated on a 4- point (0-3) scale; the scale ranges from 0-42.

Emotional Regulation Questionnaire (ERQ; Gross & John, 2003; *Appendix C-6.2*) - this self-report scale is designed to measure the amount of use of two emotion regulation strategies, cognitive reappraisal and suppression. Participants were asked to rate how they regulate and manage their emotions using a 7-point scale, from strongly disagree (infrequent use of a strategy) to strongly agree (frequent use). Mean ratings across items were used to generate the reappraisal and suppression scores; scales range between 1– 7. The ERQ sub-scales have

acceptable reliability, with mean coefficient alpha scores of 0.79 for reappraisal and 0.73 for suppression, and test-retest reliability of .69 (Gross & John, 2003).

Oxford-Liverpool Inventory of Feelings and Experiences, short-form version (O-LIFE; Mason, Linney & Claridge, 2005; Appendix C-6.3) is a 43-item measure of schizotypy, which covers "unusual experiences", "cognitive disorganization", "introvertive anhedonia" and "impulsive non- conformity" (Mason et al., 1995). These sub-scales were developed from a factor analysis of various psychosis-proneness scales based on 715 normal participants (Bentall et al., 1989). Internal consistency is high for each subscale (0.72-0.89). All of the items required a "Yes/ No" response, which will be summed up to give the final summary score. The potential ranges of scores for the subscales are: Unusual Experiences (0-12), Cognitive Disorganisation (0-11), Introvertive Anhedonia (0-10), Impulsive Nonconformity (0-10).

Cardiff Anomalous Perceptions Scale (CAPS; Bell, Halligan & Ellis, 2006; Appendix C-6.4) - is a measure of perceptual anomalies, including 32 items with 3 sub-scales: "clinical psychosis" (mainly Schneiderian first- rank symptoms), "temporal lobe disturbance" (mainly related to temporal lobe epilepsy and related seizure- like disturbances), and "chemosensation" (mainly olfactory and gustatory experience). For each item endorsed, participants were asked to rate their distress, intrusiveness and frequency on 1-5 rating scales. The questionnaire generates four separate scores: (1) total number of items endorsed; (2) a distress score; (3) an intrusiveness score; and (4) frequency of anomalous experience. The total scores for these subscales are calculated by summing the ratings for all endorsed items, with non-endorsed items receiving a score of 0. Therefore, the CAPS total ranges from 0 to 32, and for each of the subscales the possible range is 0 to 160. The internal consistency of the CAPS is good (Cronbach's alpha coefficient = 0.87; (Bell et al., 2006) and the test-retest reliability over a six-month period is highly stable (Cronbach's alpha coefficient = 0.92; (Bell et al., 2006).

Conscientiousness scale of the Big Five Inventory (John & Srivastava, 1999; Appendix C-6.5) - this 9-item measure was used to measure the personality trait of conscientiousness (John and Srivastava, 1999; McCrae and Costa, 1999). Items are scored on a 5-point Likert scale, worded "disagree strongly" (1) to "agree strongly" (5), yielding a score range of 9-45. The Big Five dimensions of personality came from lexical research on personality structures, which enjoys considerable support and has become the most widely adopted model of personality assessment (John and Srivastava, 1999); Goldberg, 1993; McCrae and John, 1992).

Conscientiousness is found to correlate with behaviour that is organized, conforming and goal-directed.

Quick-Test (Ammons & Ammons, 1962; Appendix C-6.6)- a brief cognitive test providing a measure of verbal IQ. This was used to assess individual intelligence based on perceptual-verbal performance. The examiner reads words aloud, and the participant is asked to point a picture (out of a possible four) that best matches the meaning of the word. There are 50 words on the list; the researcher continues reading the words until there were six consecutive fails. The Quick test has been found to correlate significantly with the verbal section of the Wechsler Adult Intelligence Scale (WAIS; (Wechsler, 1955) and the full WAIS scale (Abidin and Alfred, 1967).

7.3.5 Apparatus

A Dell Inspiron laptop computer was used to run the experiment software. Video-clips of instructions and audio-clips of voice stimuli were played on the laptop computer, the output of which was listened to through external speakers (for instructions) and Sennheiser HD 265 linear headphones (for the voice stimuli). A single-button USB computer mouse was attached to the laptop computer situated 2.5 metres away from the desk. A set of printed mazes and a pen were given to the participant to complete.

7.3.6 Procedure

Prospective participants were recruited through the Mindsearch research database, or responded to emails about the study sent through King's College email distribution system. Prospective participants were screened (via telephone or in person) to establish that they met the study inclusion criteria: this involved answering brief questions on whether they had experienced auditory hallucinations or psychosis in their lifetime; that their hearing and mastery of English were sufficient to comprehend the task instructions; and completing the Hospital Anxiety and Depression Scale (eligibility cut-off score of 11).

Participants were tested in a quiet testing room at the Department of Psychology, Institute of Psychiatry, King's College London. Following giving consent, participants were asked to

complete the questionnaires and a cognitive test, prior to the experimental task. All questionnaires were in paper form, given as a stapled booklet to the participant.

Participants were asked to follow the instructions that appeared on a laptop computer screen. The participants were randomly allocated by the computer program to one of the three experimental conditions – suppression, reappraisal, and acceptance. The participants were not informed of which condition they had been allocated to; similarly the researcher was unaware of allocation.

Participants were first trained in the allocated coping strategy using an automated process on the laptop computer, using video clips triggered by a program and listening to the instructions through the laptop speaker. The video clips featured a trainer who first presented a values-based rationale for the experiment (see Gutiérrez et al., 2004): emphasising how it was important for the participant to engage with the task and instructions as best they could, as the study was looking at the way people cope with hearing voices that are disrupting (e.g., "people who hear voices can find this experience difficult to manage, particularly when focusing on getting things done..."). Participants were then told that the experiment involved completing mazes in a test booklet, with the aim of achieving a high score by completing as many as possible in the time given, and that while they completed the mazes they would hear voices making critical comments on their task performance. The participants were then trained in the allocated coping strategy, watching a video clip of the trainer describing a metaphor and providing three example ways of using the coping strategy (see Appendix C-4 for the instructions for acceptance, reappraisal and suppression).

The participants were encouraged to use the coping strategy that they had received training in, as a way of ensuring they completed the task and achieve a high score. At the end of the video clip a text box appeared on the computer screen, and the participant was asked to type a description of the coping strategy they had been instructed in [these written descriptions were rated later, to ascertain participant understanding of the strategy; see results section 7.4.2 below].

All participants were additionally instructed that they had the option to reduce the volume of the voice by pressing a mouse button attached to the computer. This button was situated

some distance (2.5 metres) from the test materials, so that the participant had to move across the room to press it (i.e. to involve a cost to performance). Unknown to the participants, the button presses did not have any effect on the duration of the recorded voices. This use of deception was considered necessary to the study to: 1) provide an analogous experience to voice hearing (few people who hear voices can directly control the duration of their voices), and 2) that if participants actually had control then there may be individual differences in the task experience of participants, which would confound the effect of the conditions.

Once the video instructions were complete, a written instruction on the computer screen told the participants to put on the headphones, and then asked them to indicate when they were ready to start the experiment by pressing the space bar of the computer. A tone sounded and a message on-screen informed the participants that they could start completing the mazes in front of them on the desk in a test booklet. The instructions informed the participants that they should try to work consistently on the mazes while hearing the voices, and that they would be informed by the computer when they needed to stop (which was indicated by a single tone and a set of instructions appearing on the computer screen; participants were not informed how long the hearing voices section of the experiment would last, in order to make the experience less controllable).

Participants completed the mazes for 10 minutes while hearing the voices (see description of stimuli above). At the completion of this part of the experiment, participants were then asked on the computer screen whether they would like to do the task again (yes/no). Regardless of the response the participants were then asked to rate (using visual analogue scales on the computer screen) how unpleasant and intrusive the voices were while completing the task, how believable the voice comments were, and how much control the participant felt they had over the voices by pressing the USB mouse. The participants were then asked, via a text box appearing on the computer screen, to describe how they coped during the task [these descriptions were also rated later, to determine adherence to the allocated coping strategy; see Results section 7.4.2 below].

All participants were debriefed on the study by the researcher (including the use of deception on the volume control of the voices) at the end of the study. Participants were then remunerated £10 for their participation.

7.4 Results

Due to the simple randomisation process used, recruitment proceeded until there were at least 30 participants in each condition - this resulted in an uneven allocation of participants (Reappraisal condition N = 31; Suppression condition N = 36; Acceptance condition N = 43). All statistical analyses were conducted on the full sample, and a consecutively-recruited sample (i.e. discarding later participants once a condition had reached 30 participants): as the results of the analyses are equivalent, the results of the full sample are presented here.

7.4.1 Sample characteristics

Table 7.1 presents the descriptive statistics for the study variables for the three conditions (total sample N = 110).

Table 7.1 Means, standard deviations and percentages of measures for three conditions in Study 3

Variable	Reappraisal condition (N = 31)	Suppression condition (N = 36)	Acceptance condition (N = 43)
Measure			
Quick Test IQ	93.7 (13.4)	94.5 (8.5)	92.4 (11.1)
HADS Total	5.2 (3.3)	4.8 (3.1)	5.2 (2.9)
AAQ-II Total	17.6 (8.0)	15.0 (5.7)	15.1 (8.9)
Acceptance without Judgement (KIMS)	24.0 (6.5)	21.7 (7.6)	22.8 (8.3)
Conscientiousness	33.7 (5.5)	34.8 (5.6)	35.2 (6.1)
Unusual Experiences (O-LIFE)	2.6 (2.5)	1.6 (2.0)	2.6 (2.9)
Cognitive Disorganisation (O-LIFE)	4.1 (3.1)	2.7 (2.3)	3.4 (3.1)
Introvertive Anhedonia (O-LIFE)	2.0 (2.2)	1.1 (1.2)	1.5 (1.5)
Impulsive Non-conformity (O-LIFE)	2.5 (2.1)	2.3 (2.2)	2.4 (1.9)
Reappraisal (ERQ)	5.1 (1.0)	4.8 (1.2)	5.2 (1.2)
Suppression (ERQ)	3.3 (1.4)	3.2 (0.9)	3.3 (1.3)
CAPS Total	5.9 (5.7)	3.9 (4.2)	5.3 (6.1)

Chi -square analyses demonstrated that were there no significant differences between those participants allocated to the acceptance, reappraisal or suppression conditions on variables such as gender ($\chi^2(2) = 1.968$, p = .374), ethnicity ($\chi^2(8) = 7.083$, p = .528), level of education ($\chi^2(6) = 4.364$, p = .628), or employment status ($\chi^2(8) = 8.38$, p = .397).

Similarly ANOVAs showed that there were no significant differences between the groups on demographic and questionnaire measures: age (F (2, 107) = .696, p = .501) , levels of depressive and anxiety symptoms (F(2, 105) = .243, p = .784), IQ (F(2, 107) = .357, p = .701),

psychological flexibility (F(2, 106) = 1.035, p = .359), non-judgemental awareness(F(2, 106) = .723, p = .488), conscientiousness(F(2, 106) = .603, p = .549), and use of emotional regulation strategies of reappraisal (F(2, 105) = 1.419, p = .247) and suppression (F(2, 106) = .040, p = .961). There were no significant differences between conditions on O-LIFE subscales of unusual experiences (F(2, 105) = 2.178, p = .118), cognitive disorganization (F(2, 107) = 1.901, p = .154), introvertive anhedonia (F(2, 107) = 2.604, p = .079), and impulsive non- conformity (F(2, 107) = .086, p = .917); the CAPS total score was not significantly different across conditions (F(2, 104) = 1.119, p = .330).

7.4.2 Task validity checks

7.4.2.1 Participant understanding of instructions

Participants' post-instruction written descriptions of their understanding of the experimental coping method were classified by two independent raters, blind to condition allocation. The raters matched the description to a definition of the coping methods (listed above in the experimental instructions section), or classified the response as "Other" in the case that it did not match a definition. The result of the inter-rater analysis was Kappa 0.751 (p <.001), indicating "Substantial" agreement. Post-instructions, where there was concordance between raters on the coping strategy classified, were compared with the allocated condition. Overall, 77.3% of participants were rated to have post-instruction descriptions of a coping method that matched the condition allocated. There was no significant difference between conditions on the proportion of participants providing accurate post-instruction descriptions ($\chi^2(2) = 2.369$, p = .306).

7.4.2.2 Participant adherence to coping method trained in condition

Post-experiment written descriptions of the coping method participants reported using during the experiment were also classified by the two independent raters. The classifications for the coping methods were similar to above, classifying the description as acceptance, reappraisal or suppression, or in the case that the coping method could not be classified, as "Other". The result of the inter-rater analysis was Kappa 0.574 (p <.001), indicating "Moderate" agreement. Based on concordant ratings and comparing to condition, it was found that only 38.2% of the participants reported using the coping strategy that they had been instructed to use. There

were also significant differences between conditions on the proportion of participants who used the allocated coping strategy ($\chi^2(2) = 7.493$, p = .02), with fewer participants in the suppression condition reporting using this strategy.

7.4.3 Analyses related to study predictions

1. *It is predicted that experimental instructions using acceptance processes will produce greater behavioural (task) persistence than instructions that involve suppression or reappraisal of experiences.*

As can be seen from Table 7.2 there were no substantive differences between the groups on whether participants used the voices control method (pressing the USB) button, with only one participant (in the Reappraisal condition) pressing the button.

Table 7.2 Experiment Outcomes

Post-Experiment Ratings	Reappraisal condition (N = 31)	Suppression condition (N = 36)	Acceptance condition (N = 43)
Voice Unpleasantness	3.8 (2.6)	3.8 (2.4)	3.7 (3.0)
Voice Intrusiveness	3.5 (2.2)	3.7 (2.5)	3.4 (2.5)
Voice Believability	1.6 (1.9)	2.3 (2.2)	2.0 (2.1)
Sense of Personal Control	7.1 (2.7)	6.1 (3.5)	7.1 (2.9)
Willing to repeat experiment	74%	92%	86%
Use of voices control response	3% [1]	0%	0%

[1] One participant used the voice control button, once, at 8.35 mins .

The numbers of participants willing to repeat the experiment were high across the three conditions; Chi-square analysis did not show any significant difference between conditions on whether participants were willing to repeat the experiment again ($\chi^2(2) = 4.01$, n.s.)

2. *It is predicted that acceptance instructions will result in less intrusiveness and believability post-task, compared to either the suppression or reappraisal conditions.*

3. *It is predicted that the reappraisal condition will result in less distress, compared to both the suppression and acceptance conditions.*

There were no statistically significant differences between conditions as determined by one-way ANOVA for unpleasantness ($F(2, 107) = .007$, $p = .993$), intrusiveness ($F(2, 107) = .183$, $p = .833$), believability ($F(2, 107) = .843$, $p = .433$), or personal control ($F(2, 107) = 1.383$, $p = .255$).

Planned analyses for moderating variables are not reported here due to the lack of main effects. These multiple analyses of co-variance (MANCOVAs) are however reported in Appendix C-7 for reference purposes.

7.4.4 Post-hoc analyses

Post-hoc analyses were conducted on post-task experiment ratings of the sub-sample of participants (N=42) who were rated to have adhered with the experimental instructions. It was acknowledged that these analyses would be underpowered; as a consequence the results are reported using effect sizes.

Effect sizes were calculated using Cohen's *d*, with the mean and standard deviation of the participants in the suppression condition as the comparator, for the reappraisal and acceptance conditions.

Table 7.3 presents the results of these analyses for each of the study dependent variables. It can be seen that there are equivalent effect sizes for the reappraisal and acceptance conditions (in the direction of reduced levels) on ratings of unpleasantness (medium effect) and intrusiveness (small effect), when compared to the suppression condition. For believability the reappraisal condition (medium effect) demonstrated a comparatively larger effect than the acceptance condition (small effect), again in the direction of less believability. For the rating of personal control the acceptance condition in essence had no effect compared to the suppression condition, while the reappraisal condition had a medium effect, suggestive of a greater sense of control over the experience of voices.

Table 7.3 Standardised mean differences for participants' adherent to the experimental instructions (Cohen's *d*)

Post-Experiment Ratings	Suppression condition (N = 10)	Reappraisal condition (N = 13)	Acceptance condition (N = 19)
Voice Unpleasantness	0	-0.51	-0.52
Voice Intrusiveness	0	-0.44	-0.43
Voice Believability	0	-0.51	-0.33
Sense of Personal Control	0	0.53	0.02

NB: negative effects are preferable for ratings of unpleasantness, intrusiveness and believability, while a positive effect is preferable for a sense of personal control.

In addition to the results reported in Table 7.3 there were no differences between the groups on those who used a voices control response (as described in section 7.4.3 only one participant in the study did this; this participant was not rated as adherent). In terms of the percentage of participants that were willing to repeat the experiment, the post-hoc results by condition were: suppression (100%), reappraisal (85%), and acceptance (89%).

7.5 Discussion

The results of this study did not demonstrate any significant differences between participants who were instructed to accept, reappraise or suppress their experiences while hearing critical comments in recorded audio and completing a mazes task.

There are several potential explanations for the null results between the experimental groups:

1) *There are no substantial differences between the effects of suppression, reappraisal and acceptance*

This explanation is at odds with the bulk of the literature, at least for stimuli that are distressing and/or intrusive. This experiment was based on coping instructions that have reviously shown differences in effect, against both control conditions as well as in comparisons

between two potentially effective coping strategies (as described in Chapter 3). This is especially the case for the lack of a difference in comparing the suppression condition to the other two strategies, given the reliable findings regarding the comparatively worse effects of suppression on distress levels and tolerance (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Aldao, Nolen-Hoeksema & Schweizer, 2010; Augustine & Hemenover, 2009).

2) The study was lacked power to detect differences between experimental conditions.

The explanation that the study was under-powered to differences between conditions seems unlikely, in light of the power calculation used to determine the sample size (see section 7.3.2). As can be concluded from the results there are small effects between the groups in this study. The post-hoc analyses reported in section 7.4.4 are suggestive of potentially detectable differences between conditions, for participants adherent to the experimental instructions (discussed below).

3) The voices stimuli were not sufficiently intrusive and/ or distressing

This explanation may be the most parsimonious – the audio recordings of the voices may not have been aversive for this sample, or found sufficiently intrusive to interfere with task performance. Ratings of the unpleasantness and intrusiveness of the voices post-experiment were low on average. This can be compared with the Luciano et al (2010) study where participants were exposed to unpleasant noises (drills, babies crying etc., but not speech) and trained in acceptance vs experiential avoidance coping. Participants in the Luciano et al. (2010) study rated their distress on average 81/100 in the control (non-coping) phase; these can be compared to the current study, with participant average ratings of 3.7/10 (37/100) for unpleasantness within the suppression condition. Ratings following the acceptance condition in the Luciano et al (2010) study dropped to 42/100 on average, which is still higher than ratings reported in the current study. In a similar vein, for the post-experiment descriptions of coping a number of participants described the voices stimuli as humorous or easy to ignore as they felt that the comments did not relate to them.

Several factors may have resulted in the voices stimuli having limited intrusiveness or capacity to be distressing. Although great care was taken to include critical comments and make the

stimuli as ecologically valid as possible, there was also the need to balance this with ethical considerations, meaning that offensive material was not used (a difference from many voice hearers' experiences, see Fenekou & Georgaca, 2010), which may have limited the stimuli's capacity to be distressing. Although other studies of simulated hallucinations suggest that people do find this experience to be unpleasant (Ando et al., 2011), it is unclear to what level or for what period this distress lasts.

Another possibility is that the stimuli may have been unwittingly normalised by the introduction to the task: by describing how hearing voices is a common experience, which some people cope poorly with but others manage, may have implied that this experience can be controlled. It may be useful to limit the use of normalising language in future studies.

Similarly, by instructing the participants that there was a way to control the voices (using the USB button situated away from the computer), may have resulted in greater tolerance of the stimuli, as there was an available way to control the experience (even though this was a deception in the experiment). It may be useful in future studies to not use a potential means of escape from the experience, which may potentially increase the voices intrusiveness.

4) The mazes task may have been not challenging enough.

A potential factor may have been that the mazes task lacked challenge for the participants, and so was not affected by the concurrent experience of hearing the comments. This seems less likely as a possibility, as no participant completed all of the mazes in the available time, and most participants completed nine out of a possible sixteen mazes. Future studies that simulate the intrusive experience of auditory hallucinations could use computer-based tasks where "voices" comments are triggered by the actions of the participant, making them more closely related to the task, and appearing to respond to what the participant is doing. This may more tightly link task performance with the experience of simulated voices.

5) Participants did not use the allocated coping strategy during the experiment.

The post-experimental descriptions of the coping strategy used suggest that for the majority of the sample, participants did not engage with the instructed coping strategy. Potentially this may have occurred because the stimuli were not sufficiently distressing and/or intrusive to require the use a coping strategy (see the point above).

The results of the post-hoc analyses for those participants who adhered to the experimental instructions do suggest potential differences that may be detected in future studies. Firstly the post-hoc analyses suggest that participants in the suppression condition responded consistent with the study predictions, with higher ratings of voice unpleasantness, intrusiveness, believability, and less personal sense of control post-experiment, compared to the acceptance and reappraisal conditions. In contrast to the study prediction of an comparative advantage for the acceptance condition for intrusiveness and believability compared to reappraisal, the post-hoc analysis shows equivalence between the two conditions for intrusiveness (with small effects), and slightly larger effect favouring reappraisal for believability (a medium effect). Similarly the prediction that the reappraisal condition would have a larger effect for unpleasantness compared to acceptance was not suggested by the post-hoc analysis, with medium effects for both conditions (compared to the suppression condition). In comparing the effects for post-experiment ratings of personal control there was a distinct difference favouring the reappraisal condition (with a medium effect) and the acceptance and suppression conditions (which were equivalent). This interesting trend favouring reappraisal for personal control over the voices compared to acceptance does appear consistent with the theoretical understanding of acceptance as a process of eschewing control efforts over private experiences (e.g., Kollman, Brown & Barlow, 2009).

It may have also been that the instructions for the coping strategies were not clear enough (although most participants could describe the strategy pre-task sufficiently), or that instructions read to participants are insufficient to promote use of coping strategies. Related to this point, there is some indication from the Levin et al (2012) meta-analysis of Psychological Flexibility Model experiment components that conditions using metaphors and experiential exercises to instruct coping strategies produce larger effects than those that have instructions alone. While the use of metaphor was central to the instructions in the current study, there were no experiential exercises used; this could be a component in future studies.

It may be of benefit in future studies to have more reminders to use the allocated coping strategy, perhaps also over multiple blocks of exposure to simulated hallucinations. Similarly, it may be useful to have practice blocks for the use of the coping strategy to ensure adherence.

6) Characteristics of the participant group moderated any potential experimental effects

There is the possibility that the demographic characteristics of the participants moderated the response to the experiment conditions. The sample was highly educated, with over half the sample having completed an undergraduate education. It may be that this comparatively intelligent and resourceful group of people were more resilient to the effects of hearing negative comments while persisting with the mazes task. Future studies may benefit from recruiting from broader sources than higher education institutions, including from job centres and other community settings, to limit the effects of these demographic factors.

The participant group was diverse in ethnicity and may have had a higher proportion than previous studies of participants where English was not their first language (approximately one third of participants). Potentially this made it easier to ignore or disengage from the voice comments, through a cognitive defusion effect; it may have been easier to be psychologically distanced from critical comments in a second language either through incomprehension or greater use of interpretation before perceiving the meaning of the words. This is highly speculative, but it may have been that for these participants they more easily "tuned out" the voices as sounds, not paying attention to derive meaning (and potentially be distressed by the comments). It may be useful in future studies to recruit a sample where English is the first language, to limit the possibility of the intrusiveness of simulated auditory hallucinations being affected in this way.

Lastly the participant group were a non-clinical, non-distressed sample. It may be that there could be a different response in a group that were currently experiencing anxiety and/ or depressive symptoms, or were more psychosis-prone. Potentially such a sample might find the audio recordings more aversive and have greater need to use a coping strategy, due to less resilience or capacity to experience such a challenge. This is, of course, speculative and would require further investigation, if such a study was ethically sound.

7.6 Summary

In this analogue study of coping with voices, healthy participants trained in three different coping strategies (acceptance, reappraisal and suppression) while hearing simulated auditory hallucinations did not show significant differences on task tolerance or subjective ratings of

voice qualities and personal control post-experiment. A number of potential explanations for these null results were discussed, including whether there are differences between regulation strategies to be found, the level of challenge of the experimental task, the qualities of the simulated voices, adherence to the instructions of the experimental condition, and the nature of the sample. It is likely that factors such as the limited aversive qualities of the voice stimuli, participant non-adherence to instructions, and the nature of the sample, influenced the study outcomes.Post hoc analyses provided tentative results that the experimental conditions may produce effects in the predicted directions, for those participants who adhered to the condition instructions.

Future studies may benefit from recruiting samples that are experiencing clinical distress, or score high on psychosis-proneness, and use stimuli that are more intrusive, linked with greater prompting and contingencies for using the allocated coping strategy to produce greater participant adherence.

Chapter 8

Summary Discussion and Conclusions

8.1 Summary discussion

In this thesis I have described three studies that have explored the association of psychological flexibility with the experience of auditory hallucinations. I have used three different methodologies to study this association, in a similar vein to the multiple research strategies consistent with the contextual behavioural science paradigm (Villadarga et al., 2009). This association has been explored with clinical participants cross-sectionally and within an intervention study, and with non-clinical participants with an experimental analogue of hearing voices.

In these studies psychological flexibility has been operationalised in several ways, using components suggested by the general model (Hayes, 2004; Hayes, Strosahl & Wilson, 2012). This has included a measure of psychological flexibility in addition to mindfulness (non-judgemental acceptance) (Studies 1 and 3), or a symptom-related measure of acceptance of voices and autonomy (reduced fusion), in addition to mindfulness (non-judgemental acceptance) (Study 2). Psychological flexibility therefore has been considered as a trait-like measure (Study 1), a process variable (Study 2), and as an experimental context cued by instructions and metaphor (Study 3).

The first study explored cross-sectionally the relationship of psychological flexibility with dimensions of voice hearing, emotional dysfunction, thought control strategies and appraisals of voices. The second study explored whether an intervention that aims to increase psychological flexibility toward the experience of distressing voices would result in improvements in outcome, and whether changes in process measures such as acceptance and autonomy from voices would be associated with outcome changes. The third study investigated whether there were outcome differences in being trained in acceptance, reappraisal or suppression of experiences, for a non-clinical sample who experienced a simulation of auditory hallucinations while completing a challenging task.

In Table 8.1 is a summary of the main findings of the three studies, related to the research question.

Table 8.1 - Summary of Main Findings

Chapter	Question	Method	Answer
5 Study 1	What relationships are there between psychological flexibility, non-judgemental acceptance , appraisals of voices, coping strategies and voice distress and disability?	Correlation study: cross-sectional	Psychological Flexibility and non-judgemental acceptance show significant, negative associations with appraisals of omnipotence, use of punishment thought control, level of depressive and anxiety symptoms, and actions focused on resisting the voices
	Do psychological flexibility, mindful action, and non-judgemental acceptance result in additional predictive power for a range of dependent variables (anxiety and depression symptoms, distress and disability associated with voice hearing, efforts to resist/engage with voices), when included with variables from cognitive models (such as appraisals of malevolence and benevolence, along with thought control strategies)?	Hierarchical and logistic regression analyses	Greater variance explained in models that incorporated psychological flexibility and non-judgmental acceptance with cognitive model predictors for: - depressive and anxiety symptoms, - behavioural resistance to voices. No incremental advantage for models of: - distress associated with voice hearing, - life disruption - engagement with voices
6 Study 2	Does the introduction of acceptance and commitment therapy result in outcome changes for people experiencing distressing voices?	Intervention study: multiple baseline design	Following the introduction of ACT there were significant group-level changes in depressive symptoms, quality of life and social functioning
	Does ACT produce changes in psychological flexibility (mindfulness, acceptance) for distressed voice hearers?		Following the introduction of ACT there were significant group-level changes in psychological flexibility, in particular non-judgemental acceptance (mindfulness) and independent action from voices. There was no significant change from baseline in acceptance toward voices.
	Are there greater changes in distress and functioning, compared to frequency and duration of symptoms, following ACT for voices?		Yes - at a group level there were significant changes in depressive symptoms and social functioning, but no significant changes in the severity of auditory hallucinations.
	How does a pilot implicit measure of voice acceptance perform at baseline and following ACT for voices?		Results are difficult to interpret: across assessment phases there may be a practice effect with the implicit measure.

			At baseline, those participants who subsequently showed clinical improvements responded differentially to non-responders (in the direction of voice acceptance), possibly suggesting the implicit measure has predictive validity.
7 Study 3	In an analogue of auditory hallucinations, are there differences in distress, believability and tolerance, when healthy participants are trained to suppress, re-appraise, or actively accept the experience?	Experiment: between subjects design	No differences found between experimental conditions.
	Are the effects of suppression, reappraisal and acceptance moderated by psychological flexibility, non-judgemental awareness, schizotypy, or habitual use of emotion regulation strategies?		No moderation effects found in secondary analyses.

I will now discuss a set of conclusions that arise from the three studies, and place these within the context of the broader literature, as well as any future research directions. The limitations of the studies will be further discussed within the conclusions.

8.1.1 CONCLUSION *Psychological flexibility is demonstrated to be related to emotional wellbeing, but not symptom dimensions of voice hearing*

These relationships are demonstrated in both the correlational and intervention studies, with no significant associations found for mindfulness or psychological flexibility, or significant changes in levels of symptoms (frequency, duration) following intervention, at least as measured by a validated measure in the intervention study.

These results are consistent with previous studies investigating experiential avoidance/ psychological flexibility (Hayes et al., 2006). The negative association of psychological flexibility with depression and anxiety has been previously demonstrated for people recovering from psychosis (White et al., 2012), as well as other clinical populations (Hayes et al., 2006). Bond et al (2011) demonstrate that the construct of psychological flexibility using the Acceptance and Action Questionnaire-II is not simply analogous to a depression measure, with confirmatory factor analysis suggesting that models of the BDI-II and the AAQ-II representing different latent

variables having a better fit, than a model of both measures having the same underlying variable.

Similarly this result matches the conclusions of the meta-analysis by Chawla and Ostafin (2007), finding that experiential avoidance (psychological flexibility) showed a stronger association with general psychiatric distress, rather than with disorder-specific symptom levels or processes. This could be due to the properties of the psychological flexibility and mindfulness measures used in these studies, which were both designed for population level studies, rather than as clinical measures (Hayes, et al., 2004; Baer, Smith & Allen, 2004). A consideration could be that symptom- or problem-specific measures of experiential avoidance could demonstrate associations with symptom dimensions, similar to measures that have been developed for chronic pain (MCCracken, Vowles & Eccleston, 2004) and tinnitus (Westin, Hayes & Andersson, 2008). However, this may not be the case with psychosis: a symptom-focused measure of experiential avoidance, the Voices Acceptance and Action Scale, used in the intervention study, has previously been shown to not relate to dimensions of auditory hallucination severity, while demonstrating strong negative associations with levels of depressive symptoms and appraisals of voice omnipotence (Shawyer et al., 2007).

An implication of the results of the correlation study is that a more adequate model of emotional dysfunction for people who hear voices (depression and anxiety) appears to include both appraisals of voices and unhelpful thought control strategies, in combination with psychological flexibility and non-judgemental acceptance. It has previously been established that appraising voices as powerful does predict emotional dysfunction (e.g., Peters, Williams, Cooke & Kuipers, 2011); incorporating components from the psychological flexibility model suggests that emotional dysfunction in the context of voice hearing is exacerbated when there is a general tendency toward non-acceptance of experiences, that is associated with rigidity in adapting to situational demands or shifting behavioural repertoires when strategies compromise functioning, and a lack of commitment to actions congruent with deeply held values (Kashdan & Rottenberg, 2010). It has previously been found that acceptance is an under-used, but effective, emotion regulation strategy in people with schizophrenia (Perry, Henry & Grisham, 2011): it may be that understanding emotional dysfunction in the context of hearing voices is progressed by an appreciation of the role of experiential avoidance that can limit resilience in the face of challenging experiences (e.g., McCracken, 1998; Kashdan et al., 2006; Feldner et al., 2003).

8.1.2 CONCLUSION *Psychological flexibility and non-judgemental acceptance are negatively associated with appraisals of voice power and intention, and behaviours to resist voices*

The first study found significant negative relationships between psychological flexibility, nonjudgemental acceptance on the one hand, and appraisals of voice omnipotence and malevolence, and actions taken to resist voices.

These results are partially consistent with those found by Shawyer et al (2007), who reported that acceptance of voices was negatively associated with appraisals of voice omnipotence in a sample of people experiencing command hallucinations. However Shawyer et al did not find a relationship between voice acceptance and appraisals of malevolence, or resistance toward voices. In a similar vein, the first study results are fully consistent with those reported by Chadwick, Barnbrook and Newman-Taylor (2007) who found that a mindfulness of voices measure was negatively associated with appraisals of voice malevolence and omnipotence, as well as resistance to voices.

It may be that cognitive fusion (an outcome of the tendency to be judgemental of experience) is a useful way of considering how appraisals of voices link to subsequent behaviour, and is in turn maintained through actions to avoid or control the experience of hearing voices. It is important to consider that the direction of the relationship is unclear - it could be that appraising voices as powerful and harmful or evil in intent results in less psychological flexibility in general and greater judgement toward experiences. This could, for example, fit the theoretical frame suggested by Birchwood, Gilbert et al. (2004), where the appraisal of others, in this case voices, as powerful, could activate emotion regulation systems that lead to narrow repertoires of behaviour focused on limiting threat through avoidance and suppression of experiences. Appraising a voice as powerful and harmful may limit flexible responding: needing to escape or control the experience, necessitated by acting literally toward these appraisals (cognitive fusion) could lead to greater contact and entanglement with voices (Morrison, Haddock & Tarrier, 1995; Morrison, 2001), at the cost of action in valued life domains.

8.1.3 CONCLUSION *Changes in levels of psychological flexibility and non-judgemental awareness may be related to changes in depression, quality of life and social functioning.*

The intervention study showed the introduction of ACT following a baseline, was associated with improvements in levels of depression, quality of life and social functioning. These changes were associated with changes in non-judgmental acceptance and autonomy from voices (reduced symptom impact/ believability), but not with acceptance toward voices (this result is discussed below).

This result is consistent with the White et al (2011) trial, which found that the proportion of participants who met case-ness for depression was significantly lower following the ACT condition compared to treatment as usual. This is also consistent with the processes suggested by the Psychological Flexibility Model: that increased acceptance and other flexible responding to experience is associated with greater well-being and life vitality (Hayes et al., 2006; Ruiz, 2010). Within the limitations of the intervention study, such as the small sample size and use of non-independent ratings, this result suggests that brief ACT does increase psychological flexibility and produce positive outcomes in well-being and functioning, at least in those who responded to the intervention. This result was found following the intervention rather than during the baseline phase, providing more confidence that the finding is not simply due to the introduction of contact with the therapist.

8.1.4 CONCLUSION *Acceptance toward experiences may not imply an openness toward hearing voices.*

In the intervention study greater psychological flexibility was not associated with a greater willingness to hear voices or to accept this as an experience. Similarly while some participants became less judgemental and accepting of experiences in general, they did not necessarily become less judgemental of the experience of hearing voices. This was shown by a lack of a significant change in acceptance toward voices on the Voices Acceptance and Action Scale following ACT, as well as the session by session measure of “willingness” to hear voices.

It is likely that relying upon a single question measure, and that question being about their “willingness” to hear voices, did not adequately capture the type of acceptance that has been implied by the coping literature (e.g., Farhall & Gehrke, 1997), or suggested by Romme and

Escher (1993) as a means of better coping and finding meaning in the experience of hearing voices. The use of the Voices Acceptance and Action Scale with two subscales suggested that what changed during the intervention was the degree of autonomy that participants felt that they had from their voices: this autonomy potentially arising from a reduction in efforts to control the voices, assumed to be promoted through a stance of active acceptance (similar to that suggested by Farhall & Gehrke, 1997) and cognitive defusion. Within this frame it can also be suggested that the association of lower levels of non-judgemental awareness with efforts to resist voices, appraisals of voice power and malevolence found in the correlational study could imply the effect of cognitive fusion, and that while efforts to resist voices may function to enable values-based behaviours, the tendency to engage in judgements of experiences may also lead to personal costs in greater time spent resisting voices, a greater focus on voices as barriers to action, and distress.

*8.1.5 **CONCLUSION** Changes in levels of psychological flexibility are not necessarily associated with changes in dimensions of voice hearing*

In the intervention study it was demonstrated that while changes in levels of psychological flexibility were associated with positive changes in levels of depression and anxiety symptoms, there appeared to no significant associated change with the various dimensions of auditory hallucinations (as rated by the PSYRATS measure). The results of the intervention study suggest that reducing the tendency to engage in experiential avoidance is associated with positive emotional changes: as suggested by the correlation study experiential avoidance/ psychological flexibility is not associated with dimensions of voice hearing. Thus the results of the intervention and correlation studies are consistent in this regard.

It can be argued that this result is also consistent with previous ACT for psychosis intervention studies: in the Bach and Hayes (2002) study there were no significant changes in symptom levels such as frequency or duration of voices following intervention (albeit measured by a rating scale that had not been validated); there were similar results with the Gaudiano and Herbert (2006) trial.

In addition the intervention study results were consistent with the Gaudiano and Herbert (2006) trial results: changes in level of voice believability appeared to co-occur with changes in the outcome measures for participants. There were changes in levels of believability for those

who responded to ACT: two of the three responders reported reductions in believability toward external explanations for voices on a one-item measure, while the third responder already had an internal explanation for the origin of the voice, having rejected, prior to therapy, a long-held delusional belief.

An observation is that for several participants there were not strongly-held beliefs about the cause or origin of the voices - for example, one participant admitted that he had previously considered the voices to be part of a persecution from a political group, but that since starting his personal recovery (prior to his participation in the study) he rejected this explanation for the cause of the voices, and now appraised the voices as originating from his own mind. For this participant there was little room for his ratings of believability to change, at least in terms of lower ratings. However, it could also be observed that the study involved ratings in a belief about external causation, which the participant was defused from (he did not take this literally), however there were other aspects of the voice hearing experience that the participant was fused with, such as the urge to act on efforts to control, fix or defeat the voices before he could do other things during the day. A major component of the intervention was to work to reduce the amount of time engaged in these activities, as they were coming at the cost of other personally important actions. Thus, in a measurement sense, it may have been better, in retrospect, to measure the strength of this urge as the proxy for cognitive fusion, as it was linked more centrally to the problems that led this participant to want to engage in therapy, rather than approach believability measurement in essentially a similar way as to how conviction is measured in other psychological therapy studies.

Similarly another measure of cognitive fusion were the ratings of the amount of time that the participants felt that they had spent thinking about the voices. In the intervention study several participants had significant changes on preoccupation with voices, spending less time thinking about them. This measure may have related to occasions when participants engaged in rumination about voices, amongst other responses, and served as a means of judging how much cognitive effort the participant was engaging in related to the experience of hearing voices. There is evidence to suggest that interventions that reduce the extent to which people with psychosis engage in worry and rumination are helpful, in terms of reducing distress for those with persecutory delusions (Foster, Startup, Potts & Freeman, 2010; Hepworth, Startup & Freeman, 2011). An alternative explanation is that participants who were less preoccupied with their voices also experienced a reduction in the frequency of the voices: this was the case

for all the participants who reported reductions in preoccupation, at least on a one-item measure of voice frequency, compared to ratings on an interviewer-rated symptom-severity measure, which remained stable throughout the study.

The limitations of the design in the intervention study in terms of a lack of follow-up period to measure the maintenance of gains or any delayed effects, meant that the longitudinal relationship of psychological flexibility and non-judgemental awareness and auditory hallucination symptom dimensions cannot be determined. It may be that those who become more psychologically flexible and mindful experience less distress and entanglement with symptoms over the longer term (such as the results suggested by the long-term follow-up of an ACT for psychosis trial: Bach et al., 2012); it may also be that there are delayed effects from mindfulness and acceptance-based interventions for psychosis, similar to those effects found with cognitive behavioural therapy (Sarin, Wallin & Widerlöv, 2011).

*8.1.6 **CONCLUSION** Implicit measurement of ways of relating to voices may be possible within a psychosis population*

The results of Study 2 suggest that participants with psychotic disorders are able to complete a task of relational responding and perform with accuracy and latency that allow for measurement of implicit responding (according to the criteria outlined by Vahey et al, 2009).

The observation that the responders to ACT in the intervention study performed differently on the task than non-responders is interesting, although subsequent performance on the IRAP appears to suggest that responders and non-responders performed similarly across three further assessment points (with a bias toward non-acceptance of experience), even though there were differences between the participants when considering more explicit measures of autonomy from voices and non-judgemental awareness. It could be that this reduced difference between participants did reflect a change occurring over time due to the intervention, however competing explanations include that this was a practice effect and that task performance did not reflect clinical changes.

Further investigations of this methodology may illuminate whether it provides a reliable and valid measure of beliefs about voices and how to respond to them. The results of Study 2, suggesting a potential predictive role of implicit responses about voice acceptance, are also

worth further study: this could be done using a prospective group-based design of participants who are about to undertake psychological therapy, and the association between pre-therapy implicit response performance and post-therapy outcome studied. Further studies could also be made of associations between implicit responding for voices acceptance and appraisals of voices, behavioural and emotional responses to voices, emotional and social functioning.

*8.1.7 **CONCLUSION** Differences between strategies of acceptance, reappraisal and suppression were not evident in an experimental analogue of hearing voices*

As discussed in Chapter 7, there are several potential explanations for the lack of difference between conditions for this experimental study.

Based upon the previous experimental literature it does seem unlikely that the different instructions to suppress, accept or reappraisal would in themselves produce negligible differences between groups in outcomes such as distress or intrusiveness. A possibility is that the effects of the instructions are context-dependent: for example, it may be that the effects of acceptance to reduce the intensity of an unwanted experience only extend as far as experimentally-induced pain (cold pressor, electrical shocks), as suggested by the Kohl et al. (2012) meta-analysis. However, similar weak effects were evident also in the reappraisal and suppression conditions, which have been shown to produce effects on the intensity of aversive experiences of pain, but also a range of other psychological challenges, such as situations evoking disgust, sadness and fear (e.g., Gross, 1998).

In this experiment the coping instructions were based on those used in several other studies, including a metaphor that was a central feature (e.g., Keogh et al., 2007). These elements of the instructions appeared to be consistent with the meta-analysis by Levin et al (2012), in terms of the features (experiential, metaphorical) that are likely to increase the probability of there being an instructional effect. Thus it may be reasonable to consider that the instructions were not the weak component in the experimental study.

It is more likely that for this experimental study the voices stimuli were only mildly aversive, as is evidenced by the participants' post-task scores. Simulating auditory hallucinations using audio recordings may not be sufficient to produce an aversive stimulus that can be used in experiments investigating the potential different effects of coping strategies.

Previous studies, that have explored whether stigma toward those with schizophrenia can be influenced by such simulations, have found that audio recordings of voice content can produce emotional and physical discomfort, poor task functioning, and provide participants with the experience of cognitive impairment (Ando et al., 2011). Participants may experience negative feelings such as anger, anxiety, vulnerability, and embarrassment, amongst others (Dearing, 2008; Wise, 2009); there is tentative evidence that simulations may produce feelings of grief or hopelessness (Dearing & Steadman, 2008). Negative feelings in response to simulated hallucinations are more likely with derogatory content; in contrast the duration or volume of the simulation do not appear to make a significant difference (Brown et al., 2008). However, despite these findings estimates of the prevalence and intensity of distress in these simulations is unknown, although it is likely that distress is not particularly intense or lasting due to the high levels of acceptability of these simulations (Ando et al., 2011). Thus, in the experimental study the voices stimuli were similar in content and duration as other studies, and while it may have been the case that participants did experience discomfort, it was perhaps not at a level that interfered with task performance or necessitated using the allocated coping strategy. So, the smaller effects of the experimental conditions may have also been a function of the voices stimuli being less of a challenge than anticipated by the design.

There may be other ways to make the voices stimuli more aversive. Future studies using the same experimental paradigm could increase the aversiveness of the "voices" by 1) using more personal insults, 2) linking task performance more closely with the experience of the voices (such as using a task that competes with hearing the “voices”, such as audio discrimination task where the participant has to track several sounds, while also experiencing the voices), 3) using a more demanding task to complete while hearing the voices, that involves greater use of attention. As an analogue of hearing voices the recorded audio paradigm does have a major limitation of not being able to recreate a central feature of auditory hallucinations: that they are experiences as externally-generated without there being a clear cause or origin. This experience of hearing voices may be better engineered through a greater use of deception about the purpose of the experiment (such as not informing the participants that they will experience hearing comments about their performance, as was done in the experimental study).

As discussed in Chapter 7 a further reason for the smaller than expected effects could have been due to the nature of the sample - a highly educated and international group of

participants - that may have responded less strongly to hearing critical comments in English, as well as being a more robust group than a comparable sample of participants who may be experiencing depressive or anxiety symptoms, or have schizotypal features. Based upon the work by Kashdan et al (2006) it may be worth investigating whether highly experientially avoidant participants respond with greater distress and less tolerance to simulated hallucinations, compared to those who are more psychologically flexible. Experientially avoidant participants are more likely to engage in suppression or avoidance of negative experiences, which can increase the frequency and distress of the symptoms (García-Montes, Pérez-Álvarez, & Fidalgo, 2003). There is some evidence to suggest that interventions that reduce experiential avoidance positively impact on distress associated with hallucination-like experiences (Langer, Cangas, & Gallego, 2010).

So, it remains an open question as to whether there are differences in distress, believability and task tolerance following these different instructions while experiencing simulated hallucinations, if these moderating factors are investigated. The possibility that there is no difference between conditions seems unlikely due to the consistent findings about suppression being associated with greater intensity of distress and less tolerance (e.g., Gross, 1998; Masedo & Esteve Rosa, 2007).

Finally it may be that the participants did not engage in the allocated coping strategy, and if distressed by the voices stimuli engaged in habitual strategies to cope with the experience.

In the experimental study it was found that the a substantial number of participants did not engage in the coping strategy as trained: this finding is similar to the study by Demaree et al (2006) who found that participants can have a difficult time engaging in a specific coping strategy that have been instructed in experiments, possibly relying on habitual coping strategies instead. The post-hoc analyses of the sub-sample of participants who did adhere to the experimental instructions are suggestive of potential, interesting differences between reappraisal, acceptance and suppression. These analyses suggest both reappraisal and acceptance could be both more effective than suppression for limiting the unpleasantness and intrusiveness of voices stimuli. Consistent with the literature in Chapter 4, these tentative results suggest that reappraisal but not acceptance may be associated with greater perceived control over voices stimuli.

8.2 Clinical implications

There are several clinical implications from the results of these studies. Firstly, considering the argument that suggests habitual and extensive use of experiential avoidance is a psychological vulnerability (e.g., Kashdan et al, 2010), it may be helpful to consider this general response style in psychological therapies for distressed voice hearers. Understanding the contexts that lead to voice hearers experiencing emotional dysfunction may involve consideration of psychologically inflexible styles of coping and relating to internal experience (in addition to appraisals of voices, resistance to or engagement with voices, safety behaviours). The Psychological Flexibility Model may be helpful in clinical models of voice hearing, as it suggests vulnerabilities to a range of problems that may be considered co-morbidities, but may be the consequence of purposeful behaviours that have the function of experiential avoidance (Hayes et al., 2006). It can be suggested that experiential avoidance is a useful construct to consider within the frame of cognitive models of auditory hallucinations, as it does unite several areas identified as potential maintenance process (e.g., Morrison, 2001 model), such as safety-seeking behaviours, use of suppression and avoidance, and points to the potential efficacy of addressing this is a response style (similar to the strategy discussed by Chadwick, 2006).

A second implication from this research for psychological therapies is that in addition to addressing appraisals of voice power (omnipotence), there may also be potential in encouraging flexibility toward thinking in general. The intervention study, consistent with the ACT model, had this broad-based stance toward internal experiences (including voices): to judge their value by whether they help you to achieve valued ends (workability), and if not, to practice mindfulness and defusion to enable engagement in values-based actions. Thus, study participants practiced noticing their thoughts, emotions and auditory hallucinations as experiences (non-judgemental acceptance), rather than guides, shifting the relationship toward being an observer or container of these experiences (Bach, 2004; Chadwick, 2006). The intervention study results suggested that the participants did show greater defusion toward thoughts and voices as a group, and for those that responded to therapy in particular.

A third implication that requires further investigation is whether some people who are distressed by hearing voices may be open to acceptance before therapy, although not using this strategy consistently, and whether this could predict response to an acceptance-based

treatment. It may be that the under-utilisation of acceptance as a means of coping in people with schizophrenia (Farhall & Gehrke, 1997; Perry, Henry & Grisham, 2011) is strengthened by an explicit focus on this skill of emotion regulation, at least in order to broaden the coping repertoires which may allow for more flexible responding to unwanted experiences. It may also be that acceptance-based treatments benefit those predisposed to using acceptance, while for others this does not lead to improvements in distress, quality of life or functioning.

8.3 Future Research

In addition to the research implications discussed above, there are several general areas that can be informed by the studies that form this thesis.

8.3.1 Measurement of values and committed action

This thesis has studied psychological flexibility largely through measures of mindfulness, non-judgemental acceptance, the tendency to engage in experiential avoidance, believability and autonomy from voices. While these measures have taken or been interpreted from a functional perspective, the components of the Psychological Flexibility Model that were not studied directly in this thesis were, in particular, values and committed action. During the time that the correlation and intervention studies were planned and conducted (2006- 2008) there were not adequate measures of these processes; however, more recently values measurement has been refined (e.g., the Valuing Questionnaire: Smout et al., in press), and there are developments with committed action suggesting that it may be possible to measure greater use of approach behaviours and flexibility of behavioural repertoires (e.g., McCracken, personal communication). The development and use of measures for these processes, as well as flexible perspective taking (e.g., McHugh & Stewart, 2012) may help to better understand what role psychological flexibility play in emotional and behavioural responses to auditory hallucinations.

8.3.2 Finding better measures of cognitive fusion than "believability"

The construct of believability, reflecting cognitive fusion as described in the Psychological Flexibility Model, requires further refinement. As argued elsewhere (Farhall, Shawyer, Thomas & Morris, in press) believability is in essence measured the same way as the conviction variable from CBT for psychosis studies, although cognitive fusion is a broader process than the judged

veracity of an appraisal. Cognitive fusion instead reflects the extent to which people are psychologically entangled with and dominated by the form or content of thoughts and other private experiences (Hayes, Strosahl & Wilson, 2011, p. 69); in contexts of cognitive fusion people act as though their thoughts are a literal reality.

Recent publication of cognitive fusion measures (e.g., Gillanders et al., in press; Herzberg, Sheppard, Forsyth, Credé, Earleywine & Eifert, 2012) and studies demonstrating the associations between cognitive defusion, wellbeing, functioning in chronic pain (McCracken, Gutiérrez-Martínez & Smyth, 2012) suggest that there may be potential in exploring how a private event can act as a source of behavioural regulation (fusion), and the development of contexts that weaken this relationship (defusion). The intervention study used a measure of autonomy from voices that suggests a relationship toward voices that is not engagement or resistance, and potentially is promoted by cognitive defusion (Shawyer et al., 2007).

8.3.3 Developing measures and procedures from a functional perspective

Future studies may benefit from using more contextual measurements of the impact of voices upon life functioning, including possibly assessing the degree to which the person hearing voices can persist in valued choices and actions while having this experience (e.g., personal autonomy, Shawyer et al., 2007). In particular, it would be useful to investigate the relationship between coping and actions associated with valued living, along with ratings about life meaning and quality of life. It is theorised that lifestyles characterised by greater acceptance and mindfulness toward unwanted experiences will have a greater proportion of approach-based activities, as well as more flexible, effective problem-solving (Teasdale 2002; Hayes et al., 2004).

Thus further psychosis research guided by a functional perspective should focus on developing assessment methods that better describe life functioning, success at valued living (an acceptance & commitment therapy goal), and functional classification of coping methods depending on whether their purpose is experiential avoidance or approach.

It is suggested that in future investigations of the functional relationships between various forms of coping and distress and disability in voice-hearing, measures are developed that do not pre-suppose the *function* of a particular coping strategy. In the Beliefs About Voices Questionnaire the sub-scales of engagement and resistance assume that the emotions and

behaviours described serve the functions as named by the scales (Chadwick & Birchwood, 1994, 1995; Chadwick, Lees & Birchwood, 2000), however it is possible that different functional relationships are operating. An example of this may be the use of various forms of resistance to manage the demands of a voice giving commands: in a number of contexts this may be a functional strategy that allows the person to limit the influence of the voice(s) upon their choices and actions. Although responses of engagement and resistance have both been associated with poorer functioning (Shawyer, Farhall, Sims, & Copolov, 2005),

resistance may not necessarily be a dysfunctional coping method: it may work to have a strategic resistance to voices in order to carry out values-based actions. This could mean that actions of resistance may be flexibly applied in context (rather than a rigid, narrow repertoire) to achieve valued goals consistent with the pragmatism of the concept of workability (Hayes, Strosahl & Wilson, 1999, 2012).

A topographical approach may only look at the *form* of these strategies, instead of considering *function (e.g.,* function based assessment, Carr & LeBlanc, 2003). There may be voice hearers who are relatively successful at using a degree of resistance behaviours in the service of remaining autonomous from their voices, while there may be also those who are more engulfed or entangled by their experience of voices through the effects of certain resistance behaviours, such as rebound effects from thought suppression or argumentation that could inadvertently strengthen the importance of "fixing" the content or presence of the voices, leading to increased cognitive fusion and/or supporting experiential avoidance. It is an empirical matter to discover whether when people report using resistance as a response to voices, that they are reporting a habitual and rigid behavioural response that leads to diminished life meaning, or a workable response in context, amongst a range of other actions that helps to increase contact with valued life directions (and may result in voices being appraised as less powerful and dominating; Vaughan & Fowler, 2004).

Consistent with the functional contextual philosophy, there are several research methodologies that may be better suited to the investigating the dynamic nature of the relationship of actions that build or limit psychological flexibility and outcomes such as wellbeing, quality of life and greater autonomy in the face of unwanted experiences. The results of the correlational study, which used a cross-sectional design, suggest associations between psychological flexibility, acceptance, levels of emotional distress, voice appraisals,

and behavioural resistance to voices. This design does not allow for exploration of the dynamics of these relationships - for example in the case of resistance from voices, a longitudinal design using an Experience Sampling Method (Csikszentmihalyi & Larson, 1987) may help to better understand the functions of this behaviour in context and when there is a cost to resisting voices. Similarly in the intervention study more frequent measurement of psychology flexibility and mindfulness using this methodology may have captured changes between variables and established temporality (i.e, whether hypothesised process changes occur before outcome, suggesting mediation).

8.4 Concluding Remarks

This thesis contributes to the field of psychological flexibility and auditory hallucinations by:

1) presenting a series of studies that investigate psychological flexibility, and component processes of non-judgemental acceptance, mindfulness, cognitive defusion and behavioural autonomy from symptoms, as a process that potentially ameliorates the impact of auditory hallucinations; and thus,

2) clarifying the role that psychological flexibility makes to emotional well-being in the context of auditory hallucinations, while taking into account appraisal and thought control strategies; and,

3) demonstrating that promoting psychological flexibility using acceptance and commitment therapy may be effective in helping distressed voice hearers to have greater quality of life, less emotional distress and improve social functioning. Moreover these changes appear to be associated with concomitant changes in non-judgemental acceptance and autonomy from symptoms, and to be possibly predicted by responses to an implicit measure of acceptance toward hearing voices; and,

4) describing an attempt to ascertain differences between reappraisal, acceptance and suppression in a simulation of auditory hallucinations with non-clinical participants, that will be use to further refine experimental investigations of analogues of therapy and coping processes.

These data contribute in clarifying that psychological flexibility for voice hearers may influence emotional processes, but have more limited scope in changing directly the experience of hearing voices, in terms of voice duration, frequency and intensity. This is consistent with the theoretical frame of the Psychological Flexibility Model. The thesis also makes a contribution in clarifying methodologies that may adequately investigate psychological flexibility with auditory hallucinations, which may hopefully lead to more refined studies, and potentially more effective ways of helping people who struggle with hearing voices.

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Appendix A

Appendix A-1.1 Ethics Approval for Study 1

The Joint South London and Maudsley and The Institute of Psychiatry NHS Research Ethics Committee
PO 06
Institute of Psychiatry
De Crespigny Park
London
SE5 8AF

Telephone: 020 7 848 0533

25 July 2006

Prof D Hemsley
PO77 Dept of Psychology
Institute of Psychiatry
De Crespigny Park
London SE5 8AF

Dear Prof Hemsley

Study title: Reliability of the Acceptance and Action Questionnaire
REC reference: 066/04
Amendment form: dated 8 July 2006

The above amendment was reviewed at the meeting of the Sub-Committee of the Research Ethics Committee held on 21 July 2006.

Ethical opinion

The members of the Committee present gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

- Notice of amendment form dated 8 July 2006
- Sample items of Beck Depression Inventory II & Beck Anxiety Inventory (published form) v1 7.6.06; Kentucky Inventory of Mindfulness Skills & Thought Control Questionnaire v1 7.6.06; PSYRATS – Auditory Hallucinations subscale & Time Budget measure v1 7.6.06, revised information sheet and consent form.

Management approval

All investigators and research collaborators in the NHS should notify the R&D Department for the relevant NHS care organisation of this amendment and check whether it affects local management approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

066/04:	Please quote this number on all correspondence

Yours sincerely

Jenny Liebscher
Committee Administrator

E-mail: ethics.office@iop.kcl.ac.uk

Appendix A-1.2 Study Information Sheet & Consent Form

South London and Maudsley NHS
NHS Foundation Trust

Participant Information & Consent Form

Study Title: Reliability and validity of the Acceptance and Action Questionnaire

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?
The purpose of this study is to better understand the experience of hearing voices and the possible factors that influence how a person copes with voices. An important part of trying to understand this better is the development of questionnaires that reflect these experiences.

If you decide to participate in the study you will be asked to complete six questionnaires, as well as being interviewed. You may be asked to complete a follow-up questionnaire a month later. The questionnaires that you are being asked to complete are about your experience of hearing voices and how you have been generally feeling recently.

Your participation
It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive from the Community Mental Health Team.

Confidentiality
All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you which leaves the community mental health team will have your name and address removed so that you cannot be recognised from it. The results of the measures you complete will be compiled with other participants' and presented in form of statistical analyses.

Contact for Further Information
If you have any queries about this study please feel free to contact the principal investigator, Eric Morris.

Eric Morris
Lead Psychologist
Lambeth Early Onset Service
South London & Maudsley NHS Trust
3-6 Beale House
Lingham Street
London SW9 9HG

Telephone: 020 3228 6800
Email: Eric.Morris@slam.nhs.uk

Participant Identification Number for this study:

CONSENT FORM

Title of Project: Reliability and validity of the Acceptance and Action Questionnaire

Name of Researcher: Eric Morris

Please initial box

1. I confirm that I have read and understand the information sheet dated July 2006 (version 3) for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. ☐
3. I understand that sections of any of my medical notes may be looked by the researcher, Eric Morris. I give permission for him to have access to my records. ☐
4. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent (if different from researcher)	Date	Signature
Researcher	Date	Signature

1 for participant; 1 for researcher; 1 to be kept with medical notes

Appendix A-2 - Study Measures

Appendix A-2.1 - Acceptance and Action Questionnaire-II

AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2.	I'm afraid of my feelings.	1	2	3	4	5	6	7
3.	I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4.	My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5.	Emotions cause problems in my life.	1	2	3	4	5	6	7
6.	It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7.	Worries get in the way of my success.	1	2	3	4	5	6	7

Appendix A-2.2 - Beliefs About Voices Questionnaire-Revised

There are many people who hear voices. It would help us to find out how you are feeling about your voices by completing this questionnaire. Please read each statement and tick the box which best describes the way you have been feeling in the *past week*.

If you hear more than one voice, please complete the form for the voice which is dominant.

Thank you for your help.

Name:.....
Age:.....

		Disagree	Unsure	Slightly Agree	Strongly Agree
1	My voice is punishing me for something I have done				
2	My voice wants to help me				
3	My voice is very powerful				
4	My voice is persecuting me for no good reason				
5	My voice wants to protect me				
6	My voice seems to know everything about me				
7	My voice is evil				
8	My voice is helping to keep me sane				
9	My voice makes me do things I really don't want to do				
10	My voice wants to harm me				
11	My voice is helping me to develop my special powers or abilities				
12	I cannot control my voices				
13	My voice wants me to do bad things				
14	My voice is helping me to achieve my goal in life				
15	My voice will harm or kill me if I disobey or resist it				

		Disagree	Unsure	Slightly Agree	Strongly Agree
16	My voice is trying to corrupt or destroy me				
17	I am grateful for my voice				
18	My voice rules my life				
19	My voice reassures me				
20	My voice frightens me				
21	My voice makes me happy				
22	My voice makes me feel down				
23	My voice makes me feel angry				
24	My voice makes me feel calm				
25	My voice makes me feel anxious				
26	My voice makes me feel confident				

When I hear my voice, usually ...

		Disagree	Unsure	Slightly Agree	Strongly Agree
27	I tell it to leave me alone				
28	I try and take my mind off it				
29	I try and stop it				
30	I do things to prevent it talking				
31	I am reluctant to obey it				
32	I listen to it because I want to				
33	I willingly follow what my voice tells me to do				
34	I have done things to start to get in contact with my voice				
35	I seek the advice of my voice				

Appendix A-2.3 - Kentucky Inventory of Mindfulness Skills

Kentucky Inventory of Mindfulness Skills

Ruth A. Baer, Ph.D. University of Kentucky

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

_____1. I notice changes in my body, such as whether my breathing slows down or speeds up.

_____2. I'm good at finding the words to describe my feelings.

_____3. When I do things, my mind wanders off and I'm easily distracted.

_____4. I criticize myself for having irrational or inappropriate emotions.

_____5. I pay attention to whether my muscles are tense or relaxed.

_____6. I can easily put my beliefs, opinions, and expectations into words.

_____7. When I'm doing something, I'm only focused on what I'm doing, nothing else.

_____8. I tend to evaluate whether my perceptions are right or wrong.

_____9. When I'm walking, I deliberately notice the sensations of my body moving.

_____10. I'm good at thinking of words to express my perceptions, such as how things taste, smell, or sound.

_____11. I drive on "automatic pilot" without paying attention to what I'm doing.

_____12. I tell myself that I shouldn't be feeling the way I'm feeling.

_____13. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____14. It's hard for me to find the words to describe what I'm thinking.

_____15. When I'm reading, I focus all my attention on what I'm reading.

_____16. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____17. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____18. I have trouble thinking of the right words to express how I feel about things.

_____19. When I do things, I get totally wrapped up in them and don't think about anything else.

_____20. I make judgments about whether my thoughts are good or bad.

_____21. I pay attention to sensations, such as the wind in my hair or sun on my face.

Kentucky Inventory of Mindfulness Skills, p. 2

1	2	3	4	5
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

_____22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

_____23. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____24. I tend to make judgments about how worthwhile or worthless my experiences are.

_____25. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____26. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____27. When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things.

_____28. I tell myself that I shouldn't be thinking the way I'm thinking.

_____29. I notice the smells and aromas of things.

_____30. I intentionally stay aware of my feelings.

_____31. I tend to do several things at once rather than focusing on one thing at a time.

_____32. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____33. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____34. My natural tendency is to put my experiences into words.

_____35. When I'm working on something, part of my mind is occupied with other topics, such as what I'll be doing later, or things I'd rather be doing.

_____36. I disapprove of myself when I have irrational ideas.

_____37. I pay attention to how my emotions affect my thoughts and behavior.

_____38. I get completely absorbed in what I'm doing, so that all my attention is focused on it.

_____39. I notice when my moods begin to change.

Appendix A-2.4 - Beck Depression Inventory-II

BDI-II

Date:

Name: _____ Marital Status: _____ Age: _____ Sex: _____

Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

0 I do not feel sad.
1 I feel sad much of the time.
2 I am sad all the time.
3 I am so sad or unhappy that I can't stand it.

2. Pessimism

0 I am not discouraged about my future.
1 I feel more discouraged about my future than I used to be.
2 I do not expect things to work out for me.
3 I feel my future is hopeless and will only get worse.

3. Past Failure

0 I do not feel like a failure.
1 I have failed more than I should have.
2 As I look back, I see a lot of failures.
3 I feel I am a total failure as a person.

4. Loss of Pleasure

0 I get as much pleasure as I ever did from the things I enjoy.
1 I don't enjoy things as much as I used to.
2 I get very little pleasure from the things I used to enjoy.
3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

0 I don't feel particularly guilty.
1 I feel guilty over many things I have done or should have done.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

6. Punishment Feelings

0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7. Self-Dislike

0 I feel the same about myself as ever.
1 I have lost confidence in myself.
2 I am disappointed in myself.
3 I dislike myself.

8. Self-Criticalness

0 I don't criticize or blame myself more than usual.
1 I am more critical of myself than I used to be.
2 I criticize myself for all of my faults.
3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. Crying

0 I don't cry anymore than I used to.
1 I cry more than I used to.
2 I cry over every little thing.
3 I feel like crying, but I can't.

Subtotal Page 1

Continued on Back

PEARSON

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Beck Depression Inventory-II, p. 2

11. Agitation

0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It's hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless.
1 I don't consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compared to other people.
3 I feel utterly worthless.

15. Loss of Energy

0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don't have enough energy to do very much.
3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1–2 hours early and can't get back to sleep.

17. Irritability

0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite

0 I have not experienced any change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty

0 I can concentrate as well as ever.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

24 25 26 27 28 29 30 A B C D E

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Subtotal Page 2
Subtotal Page 1
Total Score

Appendix A-2.5 - Beck Anxiety Inventory

BAI®

NAME _____ DATE _____

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by placing an X in the corresponding space in the column next to each symptom.

	NOT AT ALL	MILDLY It did not bother me much	MODERATELY It was very unpleasant but I could stand it	SEVERELY I could barely stand it
1. Numbness or tingling.				
2. Feeling hot.				
3. Wobbliness in legs.				
4. Unable to relax.				
5. Fear of the worst happening.				
6. Dizzy or lightheaded.				
7. Heart pounding or racing.				
8. Unsteady.				
9. Terrified.				
10. Nervous.				
11. Feelings of choking.				
12. Hands trembling.				
13. Shaky.				
14. Fear of losing control.				
15. Difficulty breathing.				
16. Fear of dying.				
17. Scared.				
18. Indigestion or discomfort in abdomen.				
19. Faint.				
20. Face flushed.				
21. Sweating (not due to heat).				

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41 42 43 44 45 A B C D E
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Appendix A-2.6 - Thought Control Questionnaire

THOUGHT CONTROL QUESTIONNAIR (TCQ)

Most people experience unpleasant and/or unwanted thoughts (in verbal and/or picture form). Which can be difficult to control. We are interested in the techniques that you *generally* use to control such thoughts.

Below are a number of things that people do to control these thoughts. Please read each statement carefully, and indicate how often you use each technique by *circling* the appropriate number. There are no right or wrong answers. Do not spend too much time thinking about each one.

When I experience an unpleasant / unwanted thought:

		Never	Sometimes	Often	Almost always
1	I call to mind positive images instead	1	2	3	4
2	I tell myself not to be so stupid	1	2	3	4
3	I focus on the thought	1	2	3	4
4	I replace the thought with a more trivial bad thought	1	2	3	4
5	I don't talk about the thought to anyone	1	2	3	4
6	I punish myself for thinking the thought	1	2	3	4
7	I dwell on other worries	1	2	3	4
8	I keep the thought to myself	1	2	3	4
9	I occupy myself with work instead	1	2	3	4
10	I challenge the thought's validity	1	2	3	4
11	I get angry at myself for having the thought	1	2	3	4
12	I avoid discussing the thought	1	2	3	4
13	I shout at myself for having the thought	1	2	3	4
14	I analyse the thought rationally	1	2	3	4
15	I slap or pinch myself to stop the thought	1	2	3	4
16	I think pleasant thoughts instead	1	2	3	4
17	I find out how my friends deal with these thoughts	1	2	3	4
18	I worry about more minor things instead	1	2	3	4
19	I do something that I enjoy	1	2	3	4
20	I try to reinterpret the thought	1	2	3	4
21	I think about something else	1	2	3	4
22	I think more about the more minor problems I have	1	2	3	4
23	I try a different way of thinking about it	1	2	3	4
24	I think about past worries instead	1	2	3	4
25	I ask my friends if they have similar thoughts	1	2	3	4
26	I focus on different negative thoughts	1	2	3	4
27	I question the reasons for having the thought	1	2	3	4
28	I tell myself that something bad will happen if I think the thought	1	2	3	4
29	I talk to a friend about the thought	1	2	3	4
30	I keep myself busy	1	2	3	4

Appendix A-2.7 - Psychotic Symptom Rating Scales – Auditory Hallucinations Subscale

1 Frequency

0 Voices not present or present less than once a week
1 Voices occur for at least once a week
2 Voices occur at least once a day
3 Voices occur at least once a hour
4 Voices occur continuously or almost continuously i.e. stop for only a few seconds or minutes

2 Duration

0 Voices not present
1 Voices last for a few seconds, fleeting voices
2 Voices last for several minutes
3 Voices last for at least one hour
4 Voices last for hours at a time

3 Location

0 No voices present
1 Voices sound like they are inside head only
2 Voices outside the head, but close to ears or head. Voices inside the head may also be present
3 Voices sound like they are inside or close to ears and outside head away from ears
4 Voices sound like they are from outside the head only

4 Loudness

0 Voices not present
1 Quieter than own voice, whispers.
2 About same loudness as own voice
3 Louder than own voice
4 Extremely loud, shouting

5 Beliefs re-origin of voices

0 Voices not present
1 Believes voices to be solely internally generated and related to self
2 Holds < 50% conviction that voices originate from external causes
3 Holds ~ 50% conviction (but < 100%) that voices originate from external causes
4 Believes voices are solely due to external causes (100% conviction)

6 Amount of negative content of voices

0 No unpleasant content
1 Occasional unpleasant content (< 10%)
2 Minority of voice content is unpleasant or negative (< 50%)
3 Majority of voice content is unpleasant or negative (> 50%)
4 All of voice content is unpleasant or negative

7 Degree of negative content

0 Not unpleasant or negative
1 Some degree of negative content, but not personal comments relating to self or family e.g. swear words or comments not directed to self, e.g. 'the milkman's ugly'
2 Personal verbal abuse, comments on behavior e.g. ' shouldn't do that or say that ,
3 Personal verbal abuse relating to self-concept e.g. 'you're lazy, ugly, mad, perverted ,
4 Personal threats to self-e.g. threats to harm self or family, extreme instructions or commands to harm self or others

8 Amount of distress

0 Voices not distressing at all
1 Voices occasionally distressing, majority not distressing (< 10%)
2 Minority of voices distressing (< 50%)
3 Majority of voices distressing, minority not distressing (~ 50%)
4 Voices always distressing

9 Intensity of distress

0 Voices not distressing at all
1 Voices slightly distressing
2 Voices are distressing to a moderate degree
3 Voices are very distressing, although subject could feel worse
4 Voices are extremely distressing, feel the worst he/she could possibly feel

10 Disruption to life caused by voices

0 No disruption to life, able to maintain social and family relationships (if present)
1 Voices causes minimal amount of disruption to life e.g. interferes with concentration although able to maintain daytime activity and social and family relationships and be able to maintain independent living without support
2 Voices cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The patient is not in hospital although may live in supported accommodation or receive additional help with daily living skills
3 Voices cause severe disruption to life so that hospitalisation is usually necessary . The patient is able to maintain some daily activities, self-care and relationships while in hospital. The patient may also be in supported accommodation but experiencing severe disruption of life in terms of activities, daily living skills and/or relationships
4 Voices cause complete disruption of daily life requiring hospitalization. The patient is unable to maintain any daily activities and social relationships. Self-care is also severely disrupted.

11 Controllability of voices

0 Subject believes they can have control over the voices and can always bring on or dismiss them at will
1 Subject believes they can have some control over the voices on the majority of occasions
2 Subject believes they can have some control over their voices approximately half of the time
3 Subject believes they can have some control over their voices but only occasionally. The majority of the time the subject experiences voices which are uncontrollable
4 Subject has no control over when the voices occur and cannot dismiss or bring them on at all

Appendix B

Appendix B-1 Ethics and Research & Development Approvals

NHS
National Research Ethics Service
South East Research Ethics Committee
South East Coast Strategic Health Authority
Preston Hall
Aylesford
Kent
ME20 7NJ

Telephone: 01622 713097
Facsimile: 01622 885966

15 April 2008

Mr Eric Morris
Consultant Clinical Psychologist
South London & Maudsley NHS Foundation Trust
Lambeth Early Onset Services
3-6 Beale House, Lingham Street
Stockwell
SW9 9HG

Dear Mr Morris

Full title of study: **Measuring change processes in an acceptance-based treatment of persisting positive psychotic symptoms**
REC reference number: **08/H1102/11**

Thank you for your letter of 02 April 2008, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair's Panel.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

In response to point (i) yes definitely the carers' travel expenses to be offered and desirably their time too.

Ethical review of research sites

The Committee has not yet been notified of the outcome of any site-specific assessment (SSA) for the research site(s) taking part in this study. The favourable opinion does not therefore apply to any site at present. We will write to you again as soon as one Research Ethics Committee has notified the outcome of a SSA. In the meantime no study procedures should be initiated at sites requiring SSA.

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application		21 December 2007
Investigator CV	Eric Morris	
Protocol	1	27 December 2007
Covering Letter		27 December 2007
Letter from Sponsor	Email	10 July 2007
Peer Review		31 October 2006
Questionnaire: Rating Scales		
Questionnaire: Kentucky Inventory of Mindfulness Skills	Validated	
Questionnaire: Voices Acceptance and Action Scale (VAAS)	Validated	
Questionnaire: BAI	Validated	
Questionnaire: BDI-II	Validated	
Questionnaire: AAQ	8	01 March 2004
Participant Information Sheet: Pilot	1.0A	11 December 2007
Participant Information Sheet	1.1	03 April 2008
Participant Consent Form	1.0	11 December 2007
Response to Request for Further Information		02 April 2008
CBT Early Psychosis - Quality of Life Assessment		10 November 1998
Psychotic Symptom Rating Scales - Auditory Hallucinations (PSyrats)		
Psychotic Symptom Rating Scales - Delusions (Psyrats)		
Letter from Chair of Psychology Dept MPhil/PhD Sub Committee		14 December 2007
Supervisor CV	Emmanuelle Peters	

R&D approval

All researchers and research collaborators who will be participating in the research at NHS sites should apply for R&D approval from the relevant care organisation, if they have not yet done so. R&D approval is required, whether or not the study is exempt from SSA. You should advise researchers and local collaborators accordingly.

Guidance on applying for R&D approval is available from http://www.rdforum.nhs.uk/rdform.htm.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Website > After Review

Here you will find links to the following

a) Providing feedback. You are invited to give your view of the service that you have received from the National Research Ethics Service on the application procedure. If you wish to make your views known please use the feedback form available on the website.
b) Progress Reports. Please refer to the attached Standard conditions of approval by Research Ethics Committees.
c) Safety Reports. Please refer to the attached Standard conditions of approval by Research Ethics Committees.
d) Amendments. Please refer to the attached Standard conditions of approval by Research Ethics Committees.
e) End of Study/Project. Please refer to the attached Standard conditions of approval by Research Ethics Committees.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nationalres.org.uk .

08/H1102/11	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

Dr L. Alan Ruben
Chair

Email: nicki.watts@nhs.net

Enclosures: *Standard approval conditions*
Site approval form

Copy to: Dr Gill Lambert, Institute of Psychiatry

South East Research Ethics Committee

LIST OF SITES WITH A FAVOURABLE ETHICAL OPINION

For all studies requiring site-specific assessment, this form is issued by the main REC to the Chief Investigator and sponsor with the favourable opinion letter and following subsequent notifications from site assessors. For issue 2 onwards, all sites with a favourable opinion are listed, adding the new sites approved.

REC reference number:	08/H1102/11	**Issue number:**	0	**Date of issue:**	15 April 2008
Chief Investigator:	Mr Eric Morris				
Full title of study:	Measuring change processes in an acceptance-based treatment of persisting positive psychotic symptoms				

This study was given a favourable ethical opinion by South East Research Ethics Committee on 15 April 2008. The favourable opinion is extended to each of the sites listed below. The research may commence at each NHS site when management approval from the relevant NHS care organisation has been confirmed.

Principal Investigator	*Post*	*Research site*	*Site assessor*	*Date of favourable opinion for this site*	*Notes* (1)

Approved by the Chair on behalf of the REC:

..... *(Signature of ~~Chair~~/Co-ordinator)*

(delete as applicable)

N. WATTS (Name)

(1) *The notes column may be used by the main REC to record the early closure or withdrawal of a site (where notified by the Chief Investigator or sponsor), the suspension of termination of the favourable opinion for an individual site, or any other relevant development. The date should be recorded.*

South London & Maudsley NHS Foundation Trust
SSI Cover Sheet

This cover sheet is required for projects where SLaM resources, staff or patients are being used and submitted with your SSI form. Guidance notes on the completion of this form can be found on the R&D website http://www.iop.kcl.ac.uk/iopweb/departments/home/?locator=26

Please complete this form once funding has been agreed and before your research begins

1. SLaM investigator: (as it appears on other documentation eg NRES (COREC) ethics form)

Full Name: Eric Morris

2. Project title: (as it appears on other documentation eg NRES (COREC) ethics form)

Measuring change processes in an acceptance-based treatment of persisting positive psychotic symptoms

3. Project type

Type of Project	Tick all that apply	Further instructions
a) Own account (no formal funding/peer review received)		Peer review required see section 6
b) Externally funded (Non-commercial funding body – e.g. Charity)	X	Funders Name *Health Services Research Trustees Committee – SL&M NHS Foundation Trust*
c) Externally funded (Commercial Company)		Please contact the R&D Office to discuss potential NHS Costs & peer review
d) Student project	X	Students Name (if not PI above)
e) Clinical trial (Medicinal or Non-Medicinal)		Please contact the R&D Office for advice at an early stage

4. SLaM Service Directorate involvement & approval
Please tick all SLaM Directorates likely to be involved in the research project. Please send a brief e-mail to each service directorate manager including a short outline of your study. **Please attach each service directorate manager's e-mail response to this cover sheet and submit with your SSI form.**

SLaM Directorate	Tick those that apply	Service Directorate Manager	Service Directorate contact details
Lambeth Borough	X	Patrick Gillespie	patrick.gillespie@slam.nhs.uk
Lewisham Borough		Philip Gatter	philip.gatter@slam.nhs.uk
Southwark Borough	X	Paul Calaminus	paul.calaminus@slam.nhs.uk
Croydon Borough		Steve Davidson	steve.davidson@slam.nhs.uk
Older Adults		David Norman	david.norman@slam.nhs.uk
Child & Adolescent		Judith Bowden	judith.bowden@slam.nhs.uk
Specialist - Addictions		John Strang	j.strang@iop.kcl.ac.uk
Specialist - Learning disabilities & National	X	Declan Murphy	d.murphy@iop.kcl.ac.uk

5. Pharmacy Arrangements
If your project involves the dispensing of medication please list which Pharmacy(ies) will be involved in the dispensing. Please send a brief e-mail to each pharmacy including a short outline of your study. **Please attach each pharmacy(ies) e-mail response to this cover sheet and submit with your SSI form.**

Site	Pharmacist Involved

6. Peer review (Commercial and own account projects only)
Please propose 3 people who are independent to the project who could review your project. The R&D Office will select one of these. If you are unable to suggest names the R&D office will be able to arrange this for you.

Name and full contact address	Involved with the Project
1)	Y / N
2)	Y / N
3)	Y / N

Please complete and return this form together with:

1. Evidence of e-mail exchange/s from relevant service directorate managers and pharmacy departments as appropriate.
2. A signed paper original SSI Form, and corresponding completed NRES (COREC) ethics form for sponsor signature if you require KCL to sponsor your research.
3. If the project is own account, commercially sponsored and/or a Clinical Trial we also require a copy of your protocol.

To Gill Lambert
R&D Office (P005)
Institute of Psychiatry
De Crespigny Park
London
SE5 8AF

Tel: 020 7848 0251.
E-mail: gill.lambert@iop.kcl.ac.uk

R&D Office Use Only
Date Received: RECEIVED 21 DEC 2007

Date Approved 21/12/07.

Signed G. Lambert

2 of 2

Appendix B-2 ACT for Psychosis treatment manual (2008)

General Principles

The ACT therapeutic approach to psychosis focuses on helping clients to increase psychological flexibility in order to pursue life goals and directions that are personally meaningful. ACT assumes that psychological flexibility can be developed even when people experience persisting psychotic symptoms.

An ACT view of psychosis

ACT formulates the problems of distressing psychosis in terms of *psychological inflexibility*, where individuals experience diminished life circumstances due to excesses of experiential avoidance, over-literality about private experiences, lack of clarity and/or resignation about life directions, and difficulty with committing to actions that are effective over the longer term.

The approach of ACT encourages clients to shift agendas from experience elimination and control to pursuing greater life vitality. In terms of coping with psychotic symptoms ACT encourages a shift from *entanglement* with anomalous experiences, to orientating behaviour toward chosen values (even in the presence of anomalous experiences).

The ACT model posits that people who are distressed and disabled by psychotic symptoms are likely to be living in aversive, escape-based contexts for their behaviour. It is theorised that these contexts are largely verbally regulated (Hayes, Strosahl & Wilson, 1999). ACT helps the client to access approach-based contexts through an experiential therapeutic approach that uses a set of inter-related processes (see below for the "hexaflex" ACT model).

The ACT stance with distressing psychosis:

- Focusing on symptom impact - Exploring the effects of cognitive fusion and experiential avoidance with delusions and hallucinations
- The experience (in the case of voices), or the feared outcomes of it (delusions), are targets for avoidance and control, thereby increasing symptom impact
- Negative symptoms may be considered a possible outcome of chronic avoidance (limited social reinforcement)
- Emphasising acceptance rather than disputation
- Pragmatic truth criterion: focused on moving things forward, rather than finding the cause of psychotic symptoms
- Targets symptoms indirectly by altering the context within which they are experienced rather than frequency and believability per se

Where ACT fits as a CBT approach with psychosis

ACT is a contextual cognitive behavioural therapy approach, based upon behaviour analytic view of cognition. It uses techniques and methods taken from traditional behavioural therapy, as well as from a set of principles from a treatment model that is based upon understanding behaviour in terms of rule governance, relational frame theory and functional contextualism.

ACT emphasises acceptance of psychological experience as experience, and noticing the present moment and choices.

It can be argued that CBT for Psychosis involves components of acceptance, decentring from experience, and values-focused behaviour change. In CBT for psychosis therapists create the context for change by:

- Displaying willingness and acceptance
- Reinforcing discussion of experiences (exposure?)
- Allowing defusion through distancing (reformulation, floating alternatives, using the cognitive model in a functional way)
- Avoiding trap of being overly literal about beliefs (ie, not colluding but also not demanding belief change)
- Encouraging behaviour change even if psychotic symptoms persist (values/ behavioural regulation)

Why an experiential rather than a direct instruction/sense making approach?

The ACT model considers the effects of rule-governance (Hayes, 1989) in contributing to narrow repertoires of behaviour. It is predicted that broad, flexible responding to private experiences and life events is more likely to occur when behaviour is contingency-shaped, rather than rule-governed.

ACT targets several types of rule-governed behaviour that are theorised to contribute to client problems (pliance, tracking and augmenting: see Hayes, Wilson & Strosahl, 1999 for a discussion).

Therapy can be considered a social context where behaviour is shaped, and new rules are developed. In ACT terms it is important that new behavioural repertoires are developed that will generalise, be flexible to contextual changes, and not require the ongoing presence of the therapist for maintenance. Thus, the aim is for ACT to provide a context where contingency shaped learning occurs (rather than more rule-following): such a context is experientially- and pragmatically-focused, and non-literal in style.

The Therapeutic Relationship

The therapeutic relationship is validating, normalising, and collaborative. It is about creating a social context that teaches the limits of literal language for problem-solving, and encourages experiential learning. In rule governance terms the context of the therapeutic relationship reduces the effects of pliance, shapes effective tracking of what is workable with private experiences, and orientates formative and motivative augmenting in values based directions.

ACT sessions focus on:

- pragmatic working with client problems
- creating a context that is focused on the present moment, mindful, defused from literal language, and oriented to client values
- about identifying patterns of experiential avoidance and fusion (that contribute to distress and disability with psychotic symptoms)
- clarify client values to establish goals/focus for therapy
- gaining a sense of the clients current routine and activities, and to compare/contrast this with chosen values

ACT Made Simple *(Gaudiano, 2005)*

- Explore unworkable coping strategies (struggle, avoidance)
- Suggest acceptance (and other underused coping strategies) as an alternative stance
- Place acceptance in the context of a valued life domain
- Identify a valued goal and formulate specific action plan (however small to be accomplished today)

ACT with Psychosis methods

- Informed Consent
- Normalise psychotic symptoms & introduce observing private events (including voices) as EXPERIENCES. Broaden to contrast between having experiences and responding to them; difference between experience and action.
- Contrast experience of symptoms with responses to them, linking with workability and the function of coping methods
- Suggest acceptance and defusion (willingness/ observing/ describing experiences) as an alternate stance to (resisting/ being entangled in/ judging these experiences)
- Experientially contact a sense of self as perspective – (self as observing and containing experiences, but not the content of these experiences)
- Suggest personal values as providing direction in action, contrast with cost of experiential avoidance and fusion with experiences
- Develop step by step and progressive plans to engage in valued actions; review regularly, encouraging use of skills in acceptance, present focus, and defusion to persist or change plans as needed.

Core Clinical Processes of Acceptance and Commitment Therapy

In ACT six processes have been identified as central to the ability to persist or change in the service of valued action, and collectively define the intervention model (Hayes, et al, 2004). These core processes are based on a consistent theory of the functional properties of human language and cognition (Hayes, Barnes-Holmes & Roche, 2001). Figure 1 below shows the relationships that these core processes have with each other and the goal of greater psychological flexibility.

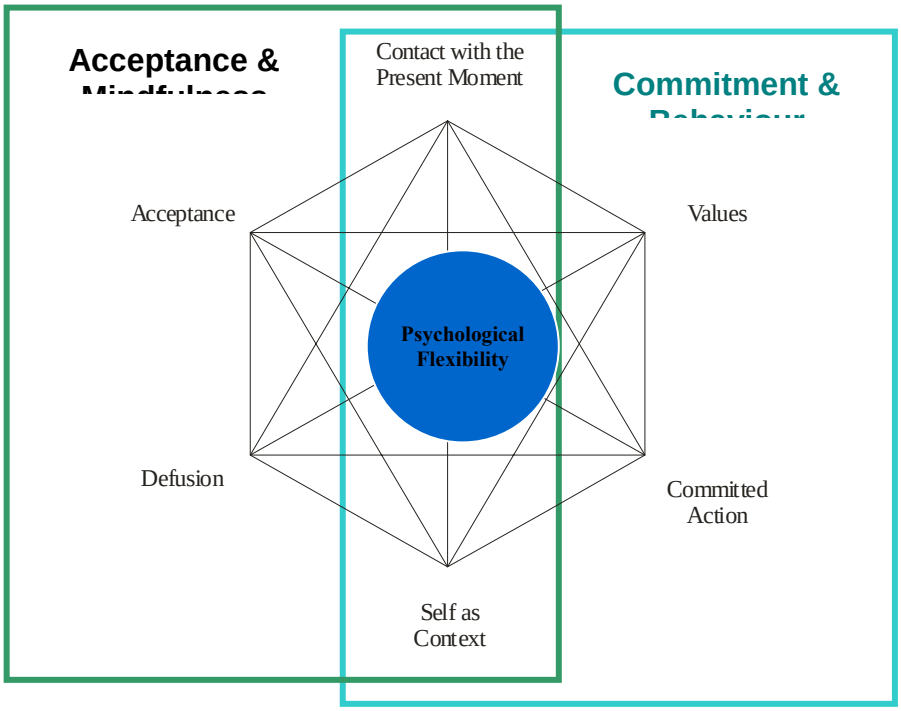


Figure 1: ACT Hexaflex (Hayes et al, 2004) illustrating the relationship between the core clinical processes.

A description (from Strosahl et al, 2004) of each of these clinical processes is as follows:

Acceptance	Foster acceptance and willingness while undermining the dominance of emotional control and avoidance in the client's response hierarchy
Defusion	Undermine the language-based processes that promote fusion, needless reason-giving, and unhelpful evaluation and thus cause private experiences to function as psychological barriers to life-promoting activities
Contact with Present Moment	Live more in the present moment, contacting more fully the ongoing flow of experience as it occurs
Self-as-Context	Make experiential contact with the distinction between self-as-context versus the conceptualised self to provide a position from which acceptance of private events is less threatening
Values	Identify valued outcomes in living that will legitimise confronting previously avoided psychological barriers
Committed Action	Build larger and larger patterns of committed action that are consistent with valued life ends

There are several principles in the delivery of these clinical processes (Hayes et al., 2004):

- The processes are highly interdependent, so that starting to use one process is likely to see the emergence of other processes. Thus there is no correct order for doing these processes.
-
- Clients will exhibit idiosyncratic profiles within these processes, so that not all the processes will need to be worked on in therapy.

- Therapists need to be highly proficient at providing interventions within any of the core processes, and avoiding using a "one size fits all" approach with regard to sequencing and form of interventions.

- Many ACT interventions touch upon multiple processes, and as therapy is contextualistic the meaning of the intervention is dependent upon the client's unique history and life situation.

<u>Considerations of mindfulness/acceptance interventions with psychosis</u>

Mindfulness with psychosis

Working with delusional/unrealistic goals

Seeing medication adherance as a workability issue

Closed eye exercises with a person experiencing psychosis

Metaphor use with schizophrenia

Case Formulation

Appendix 1 outlines an ACT case formulation process.

Developing Willingness/ Acceptance

Theoretical Rationale

Key functional goal of an ACT intervention. It is a skill rather than a concept.

The therapist fosters acceptance and willingness while undermining the dominance of emotional control and avoidance in the client's response hierarchy

Key targets (Luoma, Hayes & Walser, 2007)

- help clients let go of the agenda of control as applied to internal experience
- help clients to see experiential willingness as an alternative to experiential control
- help clients come into contact with willingness as a choice, not a desire
- help clients to understand willingness as a process, not an outcome

Process:
1) Undermine experiential control as a dominant method of relating to one's self and world;
2) Structure opportunities for the client to actively practice and intentionally develop willingness skills in the presence of previously avoided internal experience.

Example Clinical Methods

Pain and Suffering Circles
Tug of War with the Monster
Quicksand metaphor
Chinese Finger Trap exercise
Exploring short- vs long-term effects of coping methods: Clean vs Dirty Pain

Willingness: Taking a Leap; Two Scales metaphor

Adaptation for psychosis

<u>Clinical Recommendations</u>

In general it is useful to make metaphors and exercises brief and concrete with repetition to help those with limited concentration and memory (Bach, 2004).

Using physical props and/or acting out the metaphors may help in making them more concrete and evocative.

Defusion & Mindfulness

Theoretical Rationale

Undermine the language-based processes that promote fusion, needless reason-giving, and unhelpful evaluation and thus cause private experiences to function as psychological barriers to life-promoting activities

Key targets for cognitive defusion (Luoma, Hayes & Walser, 2007):

- help the clients to see thoughts as what they are – thoughts – so those thoughts can be responded to in terms of their workability given the client's values, rather than in terms of their literal meaning
- help clients attend to thinking and experiencing as an ongoing behavioural process, and away from the literal meaning of the contents of the mind.

Example Clinical Methods

Mindfulness
- Mindful Listening
- Focus on the Breath
- To sitting in a chair/ grounded by physical experience
- CD: with mindfulness exercises on the breath, lake/mountain imagery

River of Thoughts (Pankey, 2006)
Leaves on the Stream
Taking your Mind for a walk
Two Computers Metaphor
Titchener's repetition (Milk, Milk, Milk)
The Bad Cup analogy
Normalising: Mind as a Don't Get Eaten Machine
Demonstrating rebound effects from thought suppression: Pink Elephants, White Bear, Chocolate Cake

Adaptation for psychosis

There have been several recommendations in the use of mindfulness with people experiencing distressing psychosis (Chadwick et al., 2006), suggesting using briefer exercises, not requiring people to sit in one position or with their eyes closed, to have more instructions so that participants can focus on the therapists voice if having intrusions (rather than periods of silence), to include reference to voices as just another experience to notice.

Self As Context

Theoretical Rationale

Make experiential contact with the distinction between self-as-context versus the conceptualised self to provide a position from which acceptance of private events is less threatening

Key targets (Luoma, Hayes & Walser, 2007)

- help clients to make contact with a sense of self that is continuous, safe, and consistent, and from which they can observe and accept all changing experiences
- help clients differentiate this consistent sense of self as the context, arena or location in which all experience happens, from the content of that experiences (e.g., emotions, thoughts, sensations, memories)

Facilitating 3 key ACT processes:

1) decreasing an attachment to a conceptualised self,
2) creating a context in which acceptance and defusion work is not threatening,
3) fostering greater flexibility.

Example Clinical Methods

Chessboard Metaphor
"And who is noticing that"
"I'm not that" mindfulness exercise
Observer exercise

Recognising a sense of "you" exists that is aware of thoughts and emotions.
Teaching and requesting practice of mindfulness and awareness.
Actively practicing noticing a transcendent and compassionate, socially expansive sense of self in and out of the session.
Focusing on experience instead of logic.
Defusing from the content of thinking.

Adaptation for psychosis

Making exercises briefer in duration and use multiple examples, referring to these across the course of therapy (Bach, 2006).

Present Moment Focus

Theoretical Rationale

Live more in the present moment, contacting more fully the ongoing flow of experience as it occurs.

Key Targets (Luoma, Hayes & Walser, 2007)

- help clients to discover that life is happening right now, and to return to now from the conceptualised past or future
- help clients to make contact with the life that is happening now, whether it be filled with sorrow or happiness
- help clients to notice what is happening in relationships in the moment

Example Clinical Methods

Mindfulness

Leaves on the stream: watching private events come and go from an observer perspective
Raisin exercise: focus on experiencing a simple object in the moment

"Grounding" to breathing, as a moment to moment experience, can be cued in the session

Noticing private events (including voices) in the moment – describing them, noticing when you are pulled away from the present by them, and bringing your awareness back to the moment.

Therapist modelling present moment focus with statements (e.g., "just at this moment…",), drawing attention to things occurring in the present moment and in the therapeutic relationship.

Adaptation for psychosis

None discussed in the literature.

Values

Theoretical Rationale

Values are defined in ACT as "verbally constructed, global, desired, and chosen life directions (Dahl, Wilson, Luciano & Hayes, 2005).

Relates to the constructional approach (Goldiamond, 1974), and informs effective and pragmatic goal setting, allows response flexibility and motivation

Key targets (Luoma, Hayes & Walser, 2007)

- help clients contact and clarify the values that give their life meaning
- help clients link behaviour change to chosen values, while making room for their automatic reactions and experiences.

Example Clinical Methods

Values Compass
Values Bullseye
Passengers on the Bus metaphor
Values clarification exercises

- bulls eye measure
- Love – Work – Play
- Moving from goals to broader life directions (even when goals appear "psychotic")

The I-ACT valued goal setting tool

Adaptation for psychosis

Simplify values clarification for people with limited literacy, attention span or cognitive ability using values bullseye, "love-work-play" (Bach, 2006).

Less evocative content by using Lifetime Achievement Award, Lost on a Desert Island exercises rather than imagery related to death (e.g., Tombstone or Eulogy exercises) (Bach, 2006).

Explore values within unrealistic (or psychotic) goals rather than dismiss or avoid these discussions – what is that in the service of? (Bach, 2006)

Committed Action

Theoretical Rationale
Coach client to build larger and larger patterns of committed action that are consistent with valued life ends. Contact with natural reinforcement rather than arbitrary social reinforcement from therapist.

Key Targets (Luoma, Hayes &Walser, 2007):

- work with clients for behaviour change in the service of chosen values, while making room for all their automatic reactions and experiences
- help the client to take responsibility for patterns of action, building them into larger and larger units that support effective values-based living.

Committed action encompasses the behaviours and therapy targets that are specifically aimed at helping the client move from inaction to action in the realm of overt behaviour and to maintain the consistency of new, more flexible behaviour over time (Luoma, Hayes &Walser, 2007).

Example Clinical Methods

Committed action can be broken down into four steps (Luoma, Hayes & Walser, 2007):

1. Pick one or two high priority valued domains and develop an action plan for behaviour change, based on functional analysis, the best available evidence, or both.
2. Help the client commit to actions that are linked to values – to be accomplished between sessions – being mindful of the larger behavioural patterns that are being assembled.
3. Attend to and overcome barriers to action with acceptance, defusion, and mindfulness skills.
4. Return to step 1 and generalise to larger patterns of action, to other domains of living, to feared or avoided private experience, or to other areas of psychological inflexibility, until the client has sufficient practice to be able to maintain a pattern of flexible and wise committed action without the therapist's support.

Workable goals are:

- Specific and measurable
- Practical and within the client's ability to accomplish
- Not dead man goals (Lindsley, 1968): goals that a dead person could do better (e.g., not have voices)
- Public (public commitments are more likely to be carried out)
- On target and linked to client values
- Linked to the evidence and to the functional needs of the client.

Argyle Socks/Cliff Richard Fan – is it OK to "fake it" for your values?
Nail in the Hand – what if going through pain meant moving forward? What would you choose?
The I-ACT Playlist (Morris, Oliver & Bloy, 2008)
Behavioural activation strategies – goal setting, activity scheduling, mental rehearsal of skills in situations

Adaptation for psychosis
Aside from usual behaviour therapy methods it is suggested that behavioural experiments should focus on response flexibility rather than belief veracity (Wilson & Murrell, 2004).

An example 10 session ACT protocol for distressing psychosis

Session	Focus	Interventions
1	Informed consent and orientation to ACT Introduce present moment focus/ mindfulness Explore coping with symptoms – short & long-term cost, workability	Dirty Glass/Two Mountains metaphors/ therapy as a journey Mindfulness of the Breath Discuss coping methods with emotions, thoughts and voices
2	Mindfulness/getting present Introduce idea of primary and secondary pain Introduce willingness Validate and normalise efforts at control while pointing to effects Normalise experiences + discuss in decentred, observing way	Mindfulness – breath/ chair Introduce mindfulness CD Pain and Suffering Circles Two Scales metaphor Tug of War with the Monster The Mind vs You as Observer Noticing effects of thought suppression – White Bear
3	Mindfulness Review short- and long-term coping, with reference to workability/ values Control may be counterproductive Introduce values as a direction	Mindfulness – breath Mindful walking Clean vs Dirty Discomfort worksheet Chinese Fingertraps "What is this in the service of?" Miracle Question
4	Defusion Values as directions	Taking your mind for a walk exercise Two Computers metaphor Lifetime Achievement Award exercise
5	Introduce Self as Context	Chessboard, Rooms in the House metaphors

	Mindfulness/ Defusion using imagery Committed Action – link to willingness and values, contrast with experience elimination	Physicalising exercise Trains on Waterloo station Two tracks of Life sheet Where is there a choice?
6	Mindfulness Committed Action Review mindfulness & defusion	Mindfulness of the breath I-ACT activity sheet/ values bullseye
7	Mindfulness Opening to unwanted experiences in pursuit of life direction Link to values & committed action, review valued activity	Brief mindfulness exercise Unwelcome Guest metaphor/ "Guest House" poem Compass point, Swamp metaphor Gardening metaphor I-ACT
8	Mindfulness Defusion, self as context and values Review committed action and coach skills	Leaves on the Stream Continuity of self: Observer exercise I-ACT/ values bulls eye
9	Mindfulness/ self as context Review committed action and coach skills	Breathing – continuity, "I'm not that" experience vs self
10	Mindfulness Review of ACT focus:	1) continuity of private experiences 2) distancing from thoughts 3) engage in valued life process 4) take action based on values rather than symptoms

Appendix 1: Outline of ACT Assessment/Case Formulation Process (from Lillis & Luoma, 2005)

Much of the process below is taken verbatim from Chapter 3 of the *A Practical Guide to Acceptance and Commitment Therapy* (2004), by Steve Hayes and Kirk Strosahl. Please reference that chapter for more detailed information.

The most important principle in an ACT case conceptualization is that you are not just assessing a particular symptom with a particular topography; you are also attempting to understand the functional impact of the presenting complaint. Attempting to understand the function of client behavior involves a focus on the learning history of the client as well as the current context in which events happen. This context involves both the events of the client's life and the verbal context in which the client experiences these events. How their current and historical context is functionally organized will alter how the client interacts with situational variables in a way that either promotes or defeats the client's best interests. Conducting a functional analysis that captures these important variables in order to better guide treatment is
the goal of an ACT case conceptualization.

1) **Begin your assessment with an analysis of the presenting problem as formulated by the client.**

Take what the client would say is their "problem" and reformulate this in ACT consistent terms (if necessary). For example, frequently clients will nominate a set of negative private events (negative feelings, thoughts, memories, sensations, physical symptoms, and so on) as the "problem." Instead of "eliminating anxiety so that I can start to live" (the client's view of the presenting problem) you may eventually reformulate "the problem" in other ways (e.g., "warring with anxiety" or more specifically "not getting on about the business of living while needlessly warring with anxiety"). At a deeper level such reformulations must be consistent with the client's true goals and values.

Avoid buying into or challenging the initial formulation presented by the client. Take an open, data gathering stance in which you assess the client's learning history, current situational triggers, the domains of avoided private events and specific behavior avoidance patterns. Pay attention to the function of these behaviors in the client's life,
both "positive" and "negative."

From an ACT model the two most important initial case conceptualization questions are:

2) **What private experiences is the client attempting to avoid?** Assess these and outline them in the space provided.
3) **What avoidance behaviors are being used and how pervasive are they?**

Consider:
- Level of overt behavioral avoidance displayed (e.g., what parts of life has the client dropped out of, what activities/pursuits are not occurring that would occur if the problem was solved? Hint: ask "If a miracle happened and all your problems were solved, what would your life be like then?")

- Level of internally based emotional control strategies (e.g., negative distraction, negative self instruction, excessive self monitoring, dissociation)

- Level of behaviorally focused emotional control strategies (e.g., drinking, drug taking, smoking, selfmutilation, suicide attempting, overeating)

- In-session avoidance or emotional control behaviors (e.g., topic changes, counterpliance, aggressiveness, dropout risk) – While in-session barriers may not be apparent from the beginning of therapy, it may be possible to predict what could show up later and take proactive steps to address these barriers. For example, you may

find out that the client has a tendency to flee relationships when they begin to feel threatened by intimacy. Thus, you might have a conversation at the start of therapy about what the client could do, rather than leave therapy, in the case that they feel they are getting too close to the therapist.

4) **Consider factors related to motivation to change.**

- Is the "cost" of avoidance behaviors contacted in terms of daily functioning (e.g., lack of life direction, no friends, loss of important goals, addicted person has to spend all day getting his "fix", etc. If this is low or not properly contacted, consider paradox, exposure, evocative exercises before work that assumes significant personal motivation)

- Experience of the unworkability of improperly focused change efforts (if this is low, move directly to diary assessment of the workability of struggle, to experiments designed to test that)

- Clarity and importance of valued ends that are not being achieved due to target behavior and the place of these ends in the client's larger set of values (if this is low, as it often is, consider values clarification. If it is necessary to the process of treatment itself, consider putting values clarification earlier in the treatment. Consider linking work that requires significant motivation to valued activities and/or relationships.).

- Strength and importance of therapeutic relationship (if not positive, attempt to develop, e.g., through use of self-disclosure; if positive, consider integrating ACT change steps with direct support and feedback in session)

- Beliefs about consequences of facing feared events (explore client's fears and consider teaching defusion skills and willingness, titrate willingness/exposure exercises to a level client can complete successfully)

5) **What environmental factors could be barriers to client's change?**

For example, a client may be motivated to not improve in order to keep their disability payments. A spouse may be unsupportive of change because it is challenging
to them. They may have friends which encourage their drug use.

6) **Consider other factors contributing to psychological inflexibility**:

Cognitive entanglement/ fusion

Check for fusion with evaluative thoughts and conceptual categories (e.g., domination of "right and wrong" even when that is harmful; high levels of reason-giving; overuse of "insight" & "understanding," self-loathing, comparisons with or critical attitudes towards others)

Is the client overly attached to beliefs, expectations, right & wrong, good-bad evaluations of experience? Does the client confuse evaluations and experience?

Out of contact with the present moment

Does the client exhibit ongoing, fluid tracking of immediate experience? Does the client find ways to "check out" or get off in their head? Does the client seem pre-occupied with past or future or engage in lifeless story telling?

Fused with self-as-content

Can the client see a distinction between provocative and evocative content and self? Is the client's identity defined in simplistic, judgmental terms (even if positive), by problematic content or a particular life story?

Out of contact with values

Can the client describe personal values across a range of domains? Does the client see a discrepancy between current behaviors and values? Does the client describe tightly held but unexamined goals (e.g., making money) as if they are values?

Ability to build patterns of committed action
Is the client engaged in actions that promote successful working? Does the client exhibit specific, step by step pattern of action? Can the client change course when actions are not working? Are there chronic self control problems such as impulsivity, self defeating actions (e.g., procrastination, under performing, poor health behaviors, impulsive behavior)?

7) **Consider specific treatment implications/foci based on particular patterns of client behavior**, e.g.:

- *Client has a strong tendency toward rule following and being right*
  - Consider confronting reason giving through defusion strategies; pit being right versus cost to vitality; consider need for self-as-context and mindfulness work to reduce attachment to the conceptualized self.

- *High level of conviction or behavioral entanglement with unworkable strategies*
  - This is usually seen as an insistence on doing the same thing even though the client admits it doesn't seem to work. If this is an issue, consider the need to undermine the improperly targeted change agenda, using creative hopelessness interventions.

- *Belief that change is not possible combined with a strong attachment to a story that promotes this conclusion.*
  - This is often seen in chronically distressed clients or clients with history of repeated trauma. If this is an issue, consider using defusion strategies, especially attacking the attachment to the story; revisit the cost of not trying in terms of valued life goals; arrange behavioral experiments to test whether even small changes can occur.

- *Fear of the consequences of change.*
  - This is often seen in clients that are hiding in unsatisfying relationships or jobs for fear of the unknown. If this is an issue, consider working on values clarification and teaching qualities of committed action, choice and decision; work on acceptance of feared experiences under conditions of change.

- *Domination of a rigid, content-focused self-identity in which changing would pose a threat to a dearly held set of self beliefs.*
  - This is often seen in "therapy wise" clients or clients with a history of treatment failure. If this is an issue, consider undermining the story using various defusion strategies such as the autobiography rewrite; consider values work to get the client to make contact with the "cost" of holding to the story.
- *Domination of the conceptualized past or future.*
  - This is often seen in clients complaining of excessive worry, regret, or anticipatory fear that functions to block effective behavior. If this is an issue, consider self-as-process and self-as-context work, including "just noticing" interventions, and experiential exercises to help make contact with the moment. Link this to defusion work so that temporal thoughts can be caught and observed without belief or disagreement.

- *Short term effect of ultimately unworkable change strategies is evaluated as positive.*
  - This is often seen in addictive behaviors, chronic suicidality, or chronic pain. If this is an issue, consider values clarification and creative hopelessness work tied to what have you tried, how has it worked, what has it cost you?

- *Social support for avoidance and fusion.*
  - This is often seen in trauma victims, "disabled" clients of all kinds and may involve relationships, family, financial or institutional reinforcement. If this is an issue, early values clarification work can be used to highlight the cost of not changing.

8) **Consider factors contributing to psychological flexibility** (i.e., client strengths).

If a client has had past experience engaging life problems in ways that are ACT consistent, these experiences can sometimes be harnessed to allow one to move more quickly through the protocol. Current therapy efforts can usefully be linked to these past experiences, allowing these experiences to serve as models for current actions.

- Prior positive experience with mindfulness, spiritual practice or human potential concepts (if they are positive and safe from an ACT perspective, consider linking these experiences to change efforts; if they are weak or unsafe - such as confusing spirituality with dogma - consider building self-as-context and mindfulness skills)

- Episodes in life where "letting go" of urges, self defeating thoughts, uncontrollable feelings led to greater personal efficacy (i.e., Alcoholics Anonymous, smoking cessation, getting through a death)

- Moments in life when the client felt intensely present and in contact with life, even if the experience involved negative affect

- Prior experiences where laughing at oneself, seeing the irony or humor in a situation seemed to decrease the gravity associated with it

- Times in the past when the client took a course of action that was painful but was consistent with their values

- Prior experiences with setting personal goals, taking step by step concrete steps to achieve them

- Prior experiences with starting in one life direction and ending up going in another more positive direction

9) In this section, **describe specific treatment procedures for this particular client**.

Consider following a specific, relevant treatment manual that has evidence for its effectiveness.

Consider relevant ACT process and outcome measures. Consider modifications to the general, step-wise process of treatment that outlined in the ACT (1999) book.

Consider client strengths in this conceptualization and how these might be harnessed to potentially move through the process more quickly.

Consider social, financial, and vocational resources available to mobilize in treatment.

Consider use of other compatible techniques and theories that may be relevant but not directly theorized about in ACT (e.g., contingency management, skills building). Address life skills deficits (if this is an issue, consider those that may need to be addressed through first order change efforts such as relaxation, social skills, time management, personal problem solving)

Given the functions that have been identified in this assessment consider the relevant contributions of:

1. Generating creative hopelessness (client has not faced the unworkable nature of the current agenda)

2. Understanding that emotional control is the problem (client does not understand experientially the paradoxical effects of control)

3. Developing willingness (client is afraid to change behavior because of beliefs about the consequences of facing feared events)

4. Experiential exposure to the non-toxic nature of private events through acceptance and defusion (client is afraid to change behavior because of beliefs about the consequences of facing feared events)

5. Generate experiences of self-as-context to facilitate experiencing of feared events in the present moment (client is unable to separate self from reactions, memories, unpleasant thoughts; client needs safe place from which to engage in exposure)

6. Make contact with the present moment/mindfulness (client lives in conceptualized future, e.g., worry; client is not contacting reinforcements already present in the environment)

7. Values exploration (client does not have a substantial set of stated values or is out of contact with their values)

8. Engage in committed action based on chosen values (client needs help to rediscover a value based way of living; client's behavior is not generally productive or well-directed and client could use help in maintaining consistency of life direction; client has little motivation to engage in exposure)

Appendix B-3 ACT for Psychosis Adherence Measure

Participant: Therapy Session Number:

For the therapy session please rate for the presence of each of the components below.

For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 High 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	**How present in this session?**
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 Not at all 1 Minimal 2 Moderate 3 High 4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	5	6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	Excellent

Appendix of ACT Component therapist-consistent behaviours

ACT Therapeutic Stance

Any of the following:

- The therapist speaks to the client from an equal, vulnerable, genuine, and sharing point of view
- The therapist models willingness to hold contradictory or difficult ideas, feelings, memories, and the like without needing to "resolve" them.
- The therapist takes a compassionate and humanizing stance toward the client's suffering.
- The therapist always brings the issue back to what the client's experience is showing, and does not substitute his or her opinions for that genuine experience
- The therapist is willing to self disclose about personal issues when it makes a therapeutic point
- The therapist sequences and applies specific ACT interventions in response to client needs, and displays readiness to change course to fit those needs at any moment.
- New metaphors, experiential exercises and behavioural tasks are allowed to emerge from the client's own experience and context
- The therapist recognises ACT relevant processes in the moment and where appropriate directly supports these in the context of the therapeutic relationship

Developing Acceptance and Willingness/Undermining Experiential Control

Any of the following:

- Therapist communicates that client is not broken, but is using unworkable strategies
- Therapist helps client examine direct experience and detect emotional control strategies
- Therapist actively uses concept of "workability" in clinical interactions
- Therapist actively encourages client to experiment with stopping the struggle for emotional control and suggests willingness as an alternative.
- Therapist uses shifts between control and willingness, as an opportunity for the client to directly experience the contrast in vitality between the two strategies.
- Therapist helps the client investigate relationship between levels of willingness and sense of suffering
- Therapist helps client make experiential contact with the cost of being unwilling relative to valued life ends
- Therapist helps client experience the qualities of willingness (a choice, a behaviour, not wanting, same act regardless of how big the stakes)
- Therapist uses exercises and metaphors to help client contact willingness the action in the presence of difficult material
- Therapists structures graded steps or exercises to practice willingness
- Therapist detects struggle in session and teaches the client to do so

Undermining Cognitive Fusion

Any of the following:

- Therapist identifies client's emotional, cognitive, behavioral or physical barriers to willingness
- Therapist suggests that "attachment" to the literal meaning of these experiences makes willingness difficult to sustain
- Therapist actively contrasts what the client's "mind" says will work versus what the client's experience says is working
- Therapist uses language tools, metaphors and experiential exercises to create a separation between the client and client's conceptualized experience
- Therapist uses various interventions to both reveal the flow of private experience and that such experience is not "toxic"
- Therapist works to get the client to experiment with "having" these experiences, using willingness as a stance
- Therapist helps client make contact with the evaluative and reason giving properties of the client's story

Getting in Contact with the Present Moment

Any of the following:

- Therapist displays defusion from client content and direct attention to the moment
- Therapist can bring his or her own feelings or thoughts in the moment into the therapeutic relationship
- Therapist uses exercises to expand the clients sense of experience as an ongoing process
- Therapist tracks content at multiple levels and emphasizes the present when it is useful
- Therapist models coming back to the present moment
- Therapist detects client drifting into past and future orientation and comes back to now
- Therapist teaches the client to detect their own drifting into the past and future, and to come back to the present moment

Distinguishing the Conceptualized Self from Self-as-Context

Any of the following:

- Therapist helps the client differentiate self-evaluations from the self that evaluates
- Therapist employs mindfulness exercises to help client make contact with self-as-context
- Therapist uses metaphors to highlight distinction between products and contents of consciousness versus consciousness
- Therapist employs behavioral tasks to help client practice distinguishing private events from self
- Therapist helps client understand the different qualities of self conceptualization, just noticing events and simple awareness

Defining Valued Directions

Any of the following components:

- The therapist helps the client clarify valued life directions
- The therapist helps client "go on record" as wanting to stand for valued life ends
- The therapist teaches client to distinguish between values and goals
- Therapist distinguishes between outcomes and processes
- Therapist puts his or her own therapy relevant values in the room and models their importance

Building Patterns of Committed Action

Any of the following components:

- The therapist helps client identify valued life goals and build an action plan?
- The therapist encourages the client to "have" barriers and make and keep commitments
- The therapist encourages client to take small steps and to look at the quality of committed action
- The therapist keeps the client focused on larger and larger patterns of action
- The therapist integrates slips or relapses into the experiential base for future effective action

Appendix B-4 Participant voice hearing experiences, substance use and mental health treatment

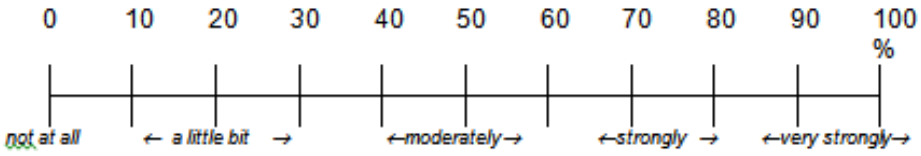
Participant	Voice Hearing Experience	Substance Use	Mental Health Treatment	
			Medication	Psychosocial
1 “Andrew”	Andrew reports that he occasionally hears 5 different voices. Although the voices are very distressing for him when they occur, he feels that he can manage to live with them. They do not interfere significantly with his life at the moment. Andrew believes voices are people using telepathy on him with malevolent intent. Voices are critical and threatening, and give commands to do boring repetitive activities. Finds voices distressing	None reported	Olanzapine 20mg Fluoxetine 40mg	Recovery-oriented community mental health team
2 “Brian”	hears the ‘grinding’ voice of Freddie Kruger around 3 or 4 times a day, for an hour at a time; makes him feel like he is being ‘bombarded’. hears voice a lot more when stressed ; voice sounds like it is coming from inside his head only, painfully loud. Unsure of cause of voice; voice content is always extremely negative and unpleasant, hears commands to kill self and youths outside his flat, resists and ignores commands. voice is always very distressing; Brian feels that voice has control over him, does not feel he has any control over the voice. Finds the voice very disruptive and exhausting, finding it difficult to do things while hearing it. Tries to distract self by cleaning flat, sometimes for hours.	None reported	Risperidone 6mg Fluoxetine 60mg Sodium Valproate	Recovery-oriented community mental health team
3 “Charles”	Believes that he is under surveillance, paranoid delusions that people are actively ruining his chances at employment and friendships; government agencies are spying on him; Hears voices that he believes are people keeping him under surveillance (90% conviction). Similarly hears comments from strangers when he is on the street etc. that he considers to be part of the surveillance. Believes that he and his family are being targeted by psychics	None reported	Clozapine	Recovery-oriented community mental health team

4 “David”	Hearing voices: commentary on actions, derogatory. 2nd person; 1 male voice, no identity; mostly at night; says he talks to them but they don’t reply; no command hallucinations; believes that voices are caused by someone using a “power” to contact him 70% conviction), uncertain of voice intention, content is derogatory, negative comments about his behaviour, which he finds distressing. Frequent paranoia and anxious when alone;	Occasional crack cocaine and cannabis use (has on-going support by Drug Services to reduce his usage); intermittent problem alcohol use; past use of heroin	Olanzapine 20mg Methadone	Recovery-oriented community mental health team Substance misuse team
5 “Edward”	Hears two to three male voices at least once a day and lasting for hours at a time. These voices sound like they are close to Edward’s head, and are louder than his own voice. Edward believes that the voices are being caused by his own mind (100% conviction), and are due to a mental illness. He reports that the 80% of the voice content is unpleasant- this is not personally insulting, but rather time-consuming, as the voices make comments about his past and various problems to solve. Edward reports that he find 90% of the voices distressing to hear, to a highly distressing level. Edward considers that he experiences a moderate degree of disruption to his life because of hearing voices, in particular the time taken dealing with the voices and their content, as well as their distracting nature, which interferes with concentrating on important activities; he wishes that he could be free of hearing voices. Edward does not think that he has any control over when the voices occur. In addition to auditory hallucinations Edward reports a daily (early morning) experience of visual hallucinations, in the form of puzzles, which he has been tempted to spend time solving. He finds this experience to be highly disruptive to his preferred activities, particularly as it is quite vivid and leading him to feel that there is little he can do until it passes.	None reported	Olanzapine	Recovery-oriented community mental health team
6 “Fiona”	Reports hearing a continuous, unidentified female voice talking in the third person, that lasts for hours at a time; sounding like it is coming from outside of her head; low volume murmuring, which can make it difficult to distinguish what the voice is saying; thinks that the voice are due to a psychiatric illness (90% conviction); sll of the voice content is unpleasant and negative, involving critical comments about Fiona’s self-concept; when more distressed can hear commands to hurt self and others, as well as threats; finds the voice always distressing, currently to a moderate degree. Describes that the voice causes a moderate amount of disruption to her life – finds it challenging to socialise and plan activities due to the intrusive and worrying nature of the voice’s comments, which contributes toward her paranoia when around others; feels that she has no control over the voice.	None reported	Clozapine	Recovery-oriented community mental health team Attends a community support group

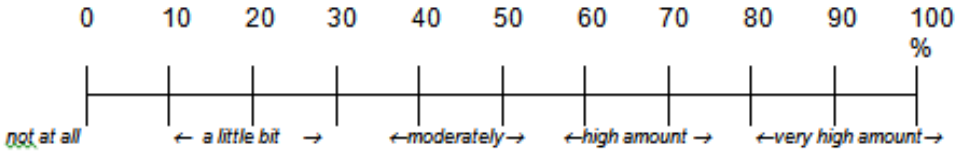
7 “Grace”	Grace reported hearing many voices, which she described as “like a crowd at a football pitch”, occurring at least 3-5 times/day, lasting up to an hour and as loud as her own voice. These are second- and third-person hallucinations heard outside of the head, male and female, and unidentified. Grace described the content as 90% unpleasant and negative. She stated that lately the voices call her names, comment on her choices and actions, but with no current threats or commands. She described the voices controlling her by causing physical pain if she does things they do not approve of, rather than receiving direct commands. She believes she would feel compelled to act if given commands, and is fearful of this happening. Grace stated that she does not know what causes the voices, but does believe the voices are real people contacting her in some way (80% conviction); she also reported that perhaps her voices are created by her mind (50% conviction). She perceived her voices as powerful and knowledgeable. Grace denied trying to get in contact with the voices, or finding them helpful. Grace does not believe that she has any control over when the voices happen. Grace described attempting to suppress voices through distraction (listening to music), trying to think of other things, and keeping busy. She also reported trying not to upset the voices, by avoiding social contact, particularly situations involving a degree of vulnerability.	None reported	Clozapine	Recovery-oriented community mental health team
8 “Heidi”	Hears a male and female voice (second person hallucinations), identified as “Jenny” and “Jim”, at least once an hour. These voices can last between 15 minutes to an hour, and sound like they are close to Heidi’s ears; the same loudness as her own voice. Heidi reported that she believes that the voices are being caused by her own mind – “I’m mad” (100% conviction); she stated that she previously thought that the voices were due to telepathy or a device being implanted in her head, but now rejects these ideas (0% conviction for both). Heidi described that 80% of the voice content is critical, with comments about her attitudes, abilities and self-concept. She denied hearing commands. Heidi stated that she always finds her voices distressing, currently to a moderate degree – “they are a sign that I am mad”. Heidi reports that she has occasional control over when the voices happen, and that she feels that they cause a moderate amount of disruption to her life, particularly in what she worries about, her ability to socialise and perform in a work environment.	Occasional cannabis use	Carbamazepine	Recovery-oriented community mental health team

Appendix B-5 - Session Rating Scale

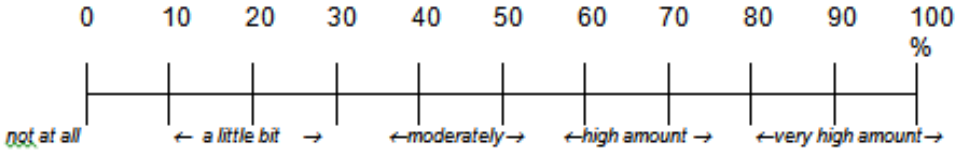
How much do you believe _____?



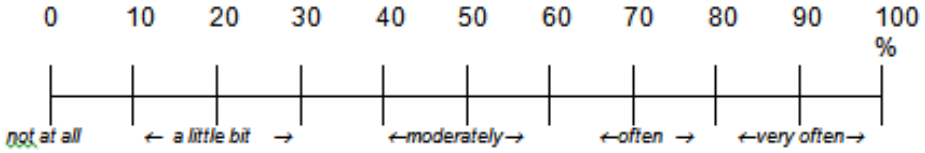
How frequently have you thought about /heard _____?



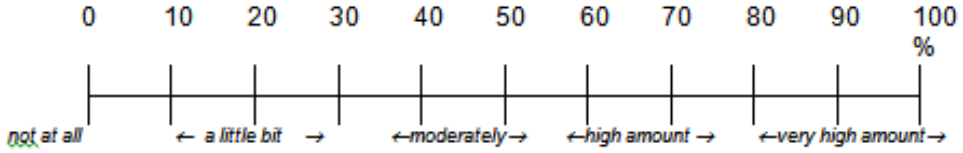
How distressing is _____?



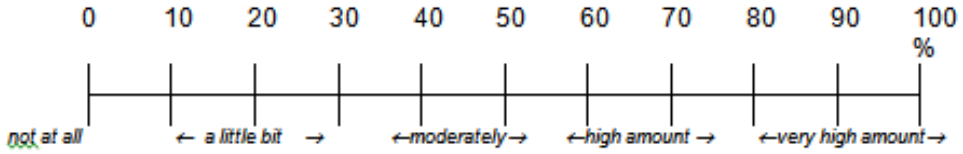
How often do you think about _____?



To what degree are you able to do what you want to do with your life, even with _____ being there?



How willing are you to have _____ as a part of your life right now?



Appendix B-6 - Measures used in Study 2

Appendix B-6.1 Manchester Short Assessment of Quality of Life

Manchester Short Assessment of Quality of Life (MANSA)

1) How satisfied are you with your life as a whole today? ☐

2) How satisfied are you with your job (or sheltered employment, or training/education as your main occupation? ☐

   Or if unemployed or retired, how satisfied are you with being unemployed/retired? ☐

3) How satisfied are you with your financial situation? ☐

4) Do you have anyone who you would call a "close friend"? **Yes / No**

5) In the last week have you seen a friend? (visited a friend, been visited by a friend or met a friend outside both your home and work)? **Yes / No**

6) How satisfied are you with the number and quality of your friendships? ☐

7) How satisfied are you with your leisure activities? ☐

8) How satisfied are you with your accommodation? ☐

9) In the past year have you been accused of a crime? **Yes / No**

10) In the past year have you been a victim of physical violence? **Yes / No**

11) How satisfied are you with your personal safety? ☐

12) How satisfied are you with the people you are living with? ☐
    Or if you live alone how satisfied are you with living alone?

13) How satisfied are you with your sex life? ☐

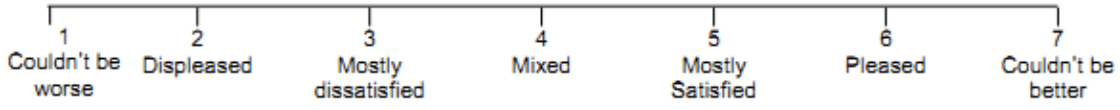
14) How satisfied are you with your relationship with your family? ☐

15) How satisfied are you with your health? ☐

16) How satisfied are you with your mental health? ☐

Use the satisfaction scale below

Satisfaction Scale



Appendix B-6.2 The Social Functioning Scale

Social Functioning Scale

Summary of Scores

	Raw Score	Transformed Score
Social Withdrawal		
Relationships		
Social Activities		
Recreational Activities		
Independence (C)		
Independence (P)		
Employment		
Total Scores		

Social Withdrawal (tick or underline the correct answers)

1. On average, what time do you get up?

Average weekday:

3	2	1	0
Before 9 am	9 – 11 am	11 am – 1 pm	after 1 pm

Average weekend:

3	2	1	0
Before 9 am	9 – 11 am	11 am – 1 pm	after 1 pm

2. How many hours of the working day do you usually spend alone?

(e.g. in your room alone, walking alone, watching TV alone)

3	Very little time / 0 – 3 hours alone
2	Some of the time / 3 – 6 hours alone
1	Quite a lot of the time / 6 – 9 hours alone
0	A great deal of the time / 9 – 12 hours alone
0	Practically all the time / more than 12 hours

3. How often do you start a conversation at home?

0	1	2	3
Almost never	rarely	sometimes	often

4. How often will you leave the house for any reason?

0	1	2	3
Almost never	rarely	sometimes	often

5. How do you react to the presence of strangers?

0	1	2	3
Avoid them	feel nervous	accept them	Like them

Relationships (tick or underline the correct answers)

1. How many friends do you have at the moment?
(people whom you see regularly, talk with, do activities with, etc.)

0	1	2	3
none	one friend	two friends	3 or more friends

2. Do you have someone with whom you find it easy to discuss feelings and difficulties?

3	0
yes	no

3. How often have you confided in them?

0	1	2	3
almost never	rarely	sometimes	often

4. Do other people discuss their problems with you?

0	1	2	3
almost never	rarely	sometimes	often

5. If not married, do you have a boyfriend/girlfriend?

3	0	3
yes	no	married

6. Have you had any arguments with friends, relatives or neighbours recently?

3	2	1	0
none	1 or 2 minor	continued minor or 1 major	many major

7. How often are you able to have a conversation with someone?

0	1	2	3
almost never	rarely	sometimes	often

8. How easy or difficult do you find talking to people at present?

3	3	2	1	0
very easy	quite easy	average	quite difficult	very difficult

9. Do you feel uneasy with groups of people?

3	2	1	0
almost never	rarely	sometimes	often

10. Do you prefer to spend time on your own?

0	1	2	3
often	sometimes	rarely	almost never

Social Activities

Over the past three months, how often have you participated in any of the following activities?

(put a tick in the appropriate boxes)

(* includes boy/girlfriend)	0 never	1 rarely	2 sometimes	3 often
Cinema				
Theatre/ concert, etc.				
Watching an indoor sport				
Watching an outdoor sport				
Art gallery/ museum				
Exhibition				
Visiting places of interest				
Meeting, talk, etc.				
Evening class				
Visiting relatives in their homes				
Being visited by relatives				
Visiting friends *****				
Being visited by friends *****				
Parties				
Formal occasions				
Disco, etc.				
Nightclub/ social club				
Playing an indoor sport				
Playing an outdoor sport				
Club/ society				
Pub				
Eating out				
Church activity				

Any other activity ?	1 rarely	2 sometimes	3 often
. . . . .			
. . . . .			
. . . . .			

Recreational Activities

Over the past three months, how often have you done any of the following activities?

(put a tick in the appropriate boxes)

	0 never	1 rarely	2 sometimes	3 often
Playing musical instruments				
Sewing, knitting				
Gardening				
Reading				
Watching television				
Listening to records or radio				
Cooking				
DIY activities.				
Fixing things (car, bike, etc).				
Walking/ rambling				
Driving/ cycling (for recreation) . .				
Swimming				
Hobby (e.g. collecting things) . . .				
Shopping				
Artistic or craft activity				

Any other recreation or pastime ?	1 rarely	2 sometimes	3 often
. . . . .			
. . . . .			
. . . . .			

Independence (Competence)

Place a tick against each item to show how able you are at doing or using the following

	3 Adequately no help needed	2 Need help or prompting	1 Unable or only with lots of help	0 Not known
Public transport				
Handling money correctly				
Budgetting				
Cooking for self				
Weekly shopping				
How to look for a job				
Washing own clothes				
Personal hygiene				
Washing, tidying, etc				
Purchasing from shops				
Leaving the house alone				
Choosing and buying clothes . . .				
Taking care of personal appearance				

Independence (Performance)

Place a tick against each item to show how often you have done the following *over the past three months*

	0 Never	1 rarely	2 sometimes	3 often
Buying items from shop alone . .				
Washing pots, tidying up, etc . . .				
Regular washing, bathing, etc . .				
Washing own clothes				
Looking for a job				
Doing the food shopping				
Prepare & cook a meal				
Leaving the house alone				
Using buses, trains, etc				
Using money				
Budgetting				
Choosing and buying own clothes .				
Taking care of personal . . . . . appearance				

Employment

1. Are you in regular employment (this includes industrial therapy, rehabilitation or retraining courses) ?
Yes / No (please underline)

IF YES:
What sort of job ? . . . . . .

How many hours a week do you work ? . . . . . .

How long have you had this job ? . . . . . .

IF NO:
When were you last in employment ? . . . . . .

What sort of job was it ? . . . . . .

How many hours a week did you work ? . . . . . .

2. If not employed:

Are you registered disabled ?
Yes / No (please underline)

Do you attend hospital as a day patient ?

Yes / No (please underline)

Do you think you are capable of some sort of employment ?

	3	2	0
*	Definitely Yes	Would have difficulty	Definitely No

How often do you make attempts to find a job?

	0	1	2	3
*	Almost never	Rarely	Sometimes	Often

3. If not employed, how do you usually occupy your day

Morning: _____

Afternoon: _____

Evening: _____

SCORING

10 = Full time gainful employment or full time student

9 = Part time gainful employment or housewife/ husband

8 = Unemployed for no more than 6 months and actively seeking work

7 = Undergoing industrial therapy or rehabilitation
If none of the above, add together scores of scales marked * for a score between 0 and 6

Appendix B-6.3 Voices Acceptance & Action Scale

Name or ID:_____ Date: __ __/ __ __/ __ __

Voices Acceptance and Action Scale (VAAS)

There are many people who hear voices that that others cannot hear. It would help us to find out how you are feeling about your voices by completing this questionnaire.

In the last 6 months, have you heard a voice or voices that tell you to do things that could result in problems or cause trouble?

☐ Yes ⇨ please complete all sections of the questionnaire.

☐ No ⇨ please complete Section A only.

Please read each statement and tick the box that best describes the way you have been feeling in the *past week*. Thank you for your help.

Section A

		Strongly Disagree	Disagree	Neutral or Unsure	Agree	Strongly Agree
1	I accept the fact that I hear voices					
2	There are worse things in life than hearing voices					
3	When I disagree with a voice, I simply notice it and move on					
4	There is no point getting on with my life while I hear voices					
5	My voices are just one part of my life					
6	I can't have a good life while I hear voices					
7	My voices stop me doing the things that I want to do					
8	Hearing voices has taken over my life					
9	I have learned to live with my voices					
10	I struggle with my voices					
11	There is more to me than just my voices					
12	When my voices say things, I accept what is helpful and reject what is not					

Please tick ☑ the appropriate box to indicate the last time you heard a voice:

☐ 1. Within the past week
☐ 2. Between 1 week and 1 month ago
☐ 3. Between 1 month and 3 months ago
☐ 4. Between 4 to 6 months ago

Section B1

		Strongly Disagree	Disagree	Neutral or unsure	Agree	Strongly Agree
13	I decide what I do, not my voices					
14	Hearing a command from a voice can cause me to do what it says					
15	I have to do what my voices say, even if I don't agree with it					
16	Just because a voice tells me to do something, it doesn't mean I have to do it					
17	My voices should take the blame when I obey them, not me					
18	Hearing my voices tell me to do something is as bad as doing it					
19	My voices are not responsible for my actions, I am					
20	It is not what my voices say, but what I do, that matters					

Section B2

When I hear a voice telling me to do something that could result in problems or cause trouble, usually…..

		Strongly Disagree	Disagree	Neutral or unsure	Agree	Strongly Agree
21	I feel overwhelmed by it					
22	I have to stop what I'm doing and focus on the voice					
23	I notice it, but I don't react to it					
24	I just accept that the voice is speaking					
25	I worry about what I might do					
26	I listen to the voice but make my own decisions					
27	I try hard to avoid feeling upset					
28	I put up with it					
29	I argue with the voice					
30	I keep focused on what I want to do					
31	I think what the voice says doesn't matter					

Please tick ☑ the appropriate box to indicate the last time you heard a voice telling you to do things that could result in problems or cause trouble:

☐ 1. Within the past week
☐ 2. Between 1 week and 1 month ago
☐ 3. Between 1 month and 3 months ago
☐ 4. Between 4 to 6 months ago

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Appendix B-6.4 Acceptance without Judgement subscale (Kentucky Inventory of Mindfulness Skills)

Participant # ☐☐☐

KIMS (AWJ)

Please rate each of the following statements using the scale provided. Circle the number that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

1. I criticize myself for having irrational or inappropriate emotions.	1	2	3	4	5
2. I tend to evaluate whether my perceptions are right or wrong.	1	2	3	4	5
3. I tell myself that I shouldn't be feeling the way I'm feeling.	1	2	3	4	5
4. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.	1	2	3	4	5
5. I make judgments about whether my thoughts are good or bad.	1	2	3	4	5
6. I tend to make judgments about how worthwhile or worthless my experiences are.	1	2	3	4	5
7. I tell myself that I shouldn't be thinking the way I'm thinking.	1	2	3	4	5
8. I think some of my emotions are bad or inappropriate and I shouldn't feel them.	1	2	3	4	5
9. I disapprove of myself when I have irrational ideas.	1	2	3	4	5

Appendix B-7 Ratings of therapy adherence

ACT for Voices Study Adherence Ratings

Participant: 004 Therapy Session Number: 2

For the therapy session please rate for the presence of each of the components below.
For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 XVery High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4X Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 X High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 XVery High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 XHigh 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 XSatisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 XSatisfactory 3 High 4 Very High
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 XSatisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 XSatisfactory 3 High 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 XMinimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	How present in this session?
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	5	X6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	**Excellent**

Comments:
The tiger metaphor was very good.
I liked how you used physicalisation; it was very good.
I thought that 'your mind doesn't always have your best interests at heart' was good.

ACT for Voices Study Adherence Ratings

Participant: 004 Therapy Session Number: 4

For the therapy session please rate for the presence of each of the components below.
For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4X Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh **4 Very High**
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **X4 Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	How present in this session?				
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	5	X6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	**Excellent**

Comments: 'Struggling with the monster' metaphor seemed to work well.

When soldiers in the parade didn't work out well at first, it was a good move to then write the client's current thoughts down on paper: very nice.

'Those feelings become the boss of you.' I like that term and how you used it in the session.

'We should be guided by what we care about, not by what you feel.' You used that very well.

Good homework assignment. It nicely integrated the concepts that you worked on in the session.

ACT for Voices Study Adherence Ratings

Participant: 004 Therapy Session Number: 10

For the therapy session please rate for the presence of each of the components below.
For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4X Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh **4 Very High**
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal **2 XSatisfactory** 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **X4 Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal **2 XSatisfactory** 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	How present in this session?				
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	5	X6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	**Excellent**

Comments:

I liked how you explored the ways the client could make room for his depression (e.g., passengers on the bus and the mindfulness exercise, which was done very thoroughly).

It was good to ask the client what he wanted to work on during this final session.

Very good job at reviewing what was learnt during therapy. It appears that the client really took on board the concepts of acceptance

ACT for Voices Study Adherence Ratings

Participant: 006 Therapy Session Number: 1

For the therapy session please rate for the presence of each of the components below.
For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High 4 XVery High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4X Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 XSatisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 XSatisfactory 3 High 4 Very High
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 XSatisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 XMinimal 2 Satisfactory 3 High 4 Very High
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2X Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal X2 Satisfactory 3 High 4 Very High
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 XMinimal 2 Satisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 XSatisfactory 3 High 4 Very High
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory X3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly X4 Very Highly	0 Unresponsive 1 Minimal 2 Satisfactory X3 High 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 XSatisfactory 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly 4 XVery Highly	0 Unresponsive 1 Minimal 2 Satisfactory 3 XHigh 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	How present in this session?				
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	X5	6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	**Very Good**	Excellent

I liked how you really focused on identifying valued directions and just sprinkled that with more mindfulness concepts. I think that it really worked for this particular person.

ACT for Voices Study Adherence Ratings

Participant: 006 Therapy Session Number: 5

For the therapy session please rate for the presence of each of the components below.
For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4X Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal **2 XSatisfactory** 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2Satisfactory **3x High** 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3X High** 4 Very High
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal **2 XSatisfactory** 3 High 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal **2 XSatisfactory** 3 High 4 Very High
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 X Very High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4X Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3X High** 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	How present in this session?
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 XNot at all 1 Minimal 2 Moderate 3 High 4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	X5	6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	**Very Good**	Excellent

Comments:

Nil

ACT for Voices Study Adherence Ratings

Participant: 006 Therapy Session Number: 10

For the therapy session please rate for the presence of each of the components below.
For each component that is *present*, please rate how *appropriate* for this stage of therapy, and then rate *client responsiveness* to this component.

ACT Therapeutic Stance	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4X Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Developing Acceptance and Willingness/Undermining Experiential Control	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Undermining Cognitive Fusion	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory 3 High **4 XVery High**
Getting in Contact with the Present Moment	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3X High** 4 Very High
Distinguishing the Conceptualized Self from Self-as-context	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High
Defining Valued Directions	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 X Very High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4X Very Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3X High** 4 Very High
Building Patterns of Committed Action	**How present in this session?**	**How appropriate for this stage of therapy?**	**Client Responsiveness?**
	0 Not at all 1 Minimal 2 Satisfactory 3 High **4 XVery High**	0 Inappropriate 1 Minimally 2 Satisfactory 3 Highly **4 XVery Highly**	0 Unresponsive 1 Minimal 2 Satisfactory **3 XHigh** 4 Very High

ACT-Inconsistent techniques/ Proscribed behaviours	How present in this session?				
Did the therapist explains the "meaning" of paradoxes or metaphors (possibly to develop "insight")	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist engage in criticism, judgement or taking a "one up" position?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist argue with, lecture, coerce or attempt to convince the client?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist substitute his or her opinions for the client's genuine experience of what is working/ not working?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Did the therapist model the need to resolve contradictory or difficult ideas, feelings, memories, and the like?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Evidence for Delusional Beliefs: Did the therapist assess the evidence that the client uses to support his/her delusional beliefs?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Validity Testing/Behavioural Experiments: Did the therapist encourage the client to 1) engage in specific behaviours for the purpose of testing the validity of their beliefs, OR 2) make explicit predictions about external events so that the outcomes of those events could serve as tests of those predictions OR 3) review the outcome of previous validity tests?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Colombo Style: Did the therapist help the client to explain his/her reasons for holding a belief by apologising for being confused about it all but then carefully questioning to gain the details?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High
Verbal Challenge of Delusions: Did the therapist challenge the client's beliefs through discussion?	0 XNot at all	1 Minimal	2 Moderate	3 High	4 Very High

Overall Rating

How would you rate the clinician **overall** in this session, as an ACT therapist?

0	1	2	3	4	5	X6
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	**Excellent**

Comments:

It seems that you really got him to take on board the ~~value of moving in valued directions. Could have~~ let him say what he was struggling with instead of listing possibilities.

Not sure why you asked 'what's that like?', in response to him saying that he didn't like his suicidal thoughts. Great, though, in helping him to distinguish having thoughts and getting caught up in thoughts.

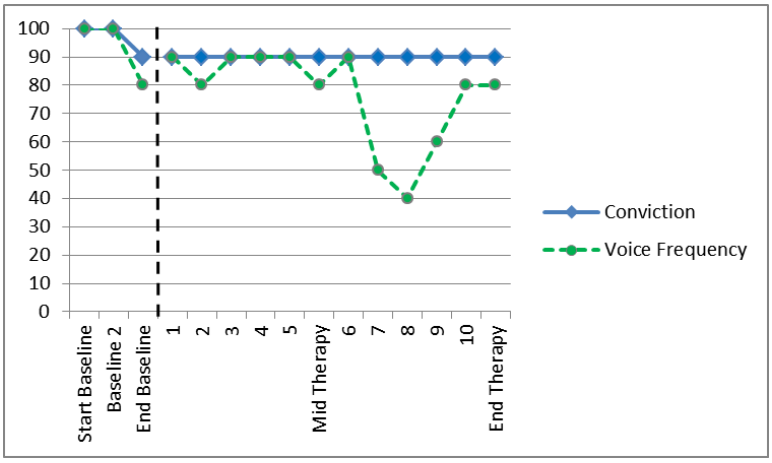
Ask him whether or not getting caught-up in his thoughts work, instead of telling him. (It wasn't a changer, though!)

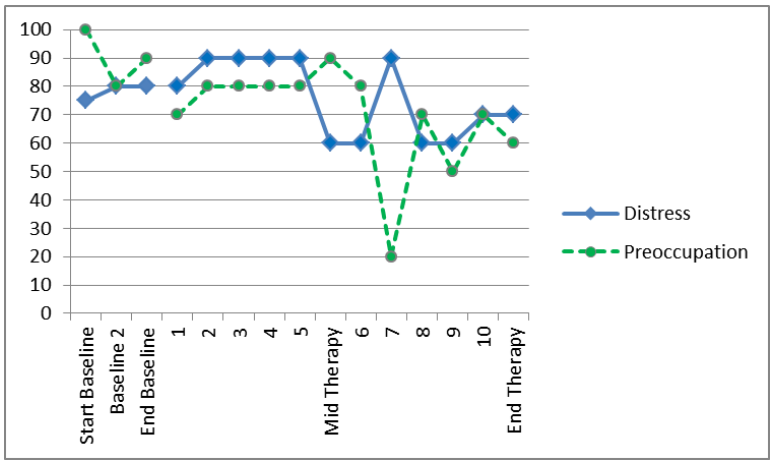
It's interesting to see how you appeared to focus more on fusion in the later sessions. I don't often see that, but I think that it worked with this person.

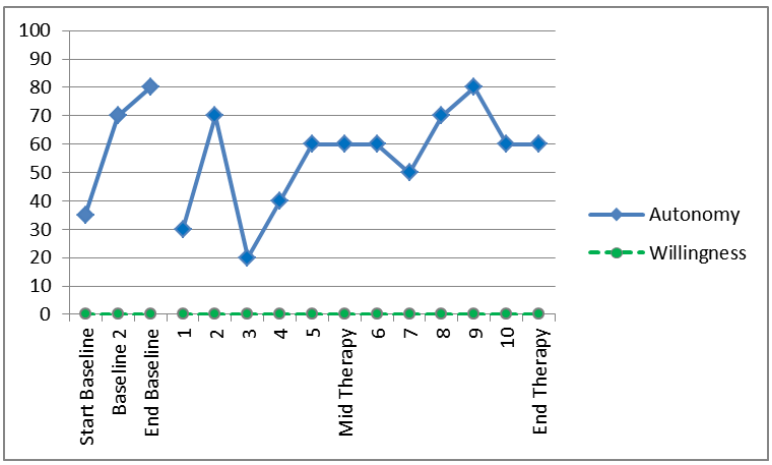
Good at using the review of the sessions as an opportunity to reinforce what you've been trying to teach and reinforce throughout the sessions.

Appendix B-8 Session ratings for participants

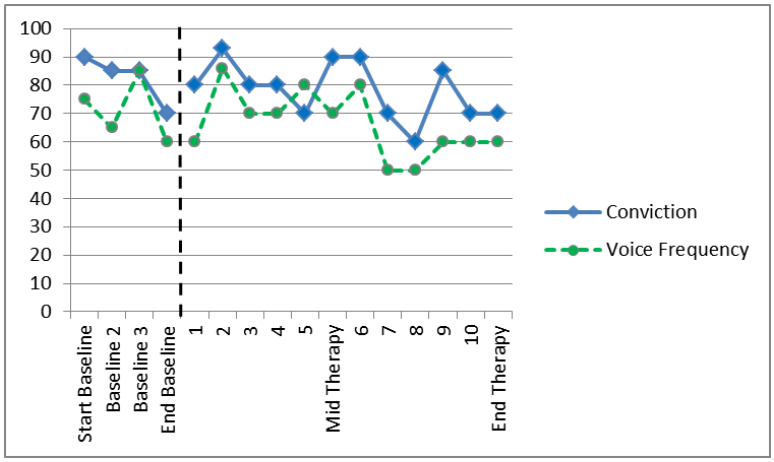
Participant 1 – "Andrew"

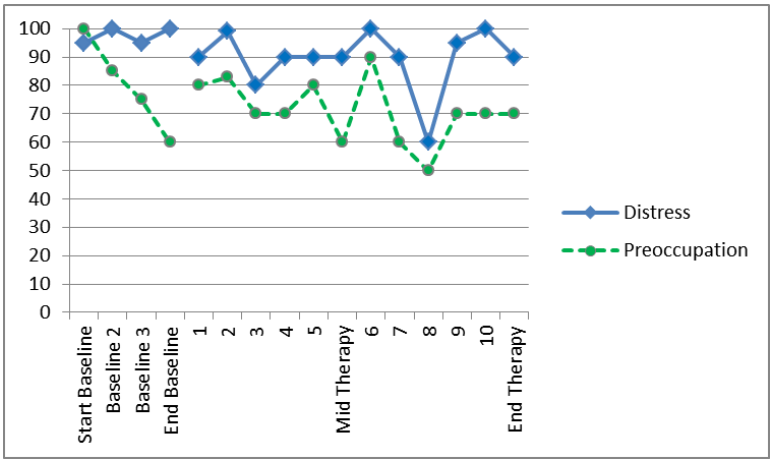


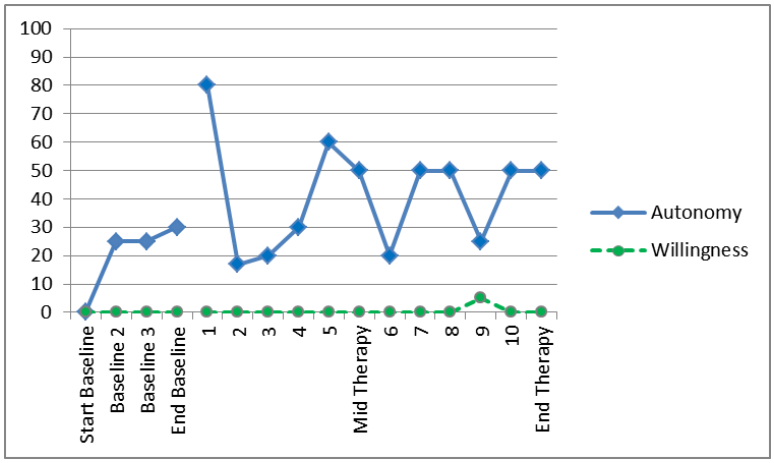




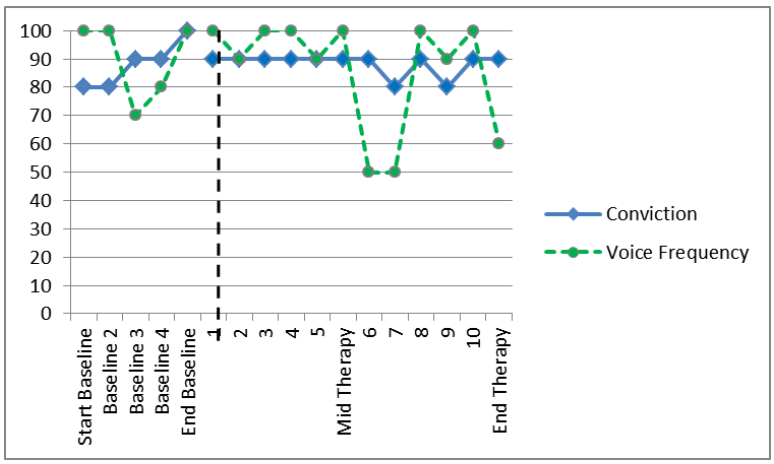
Participant 2 – "Brian"

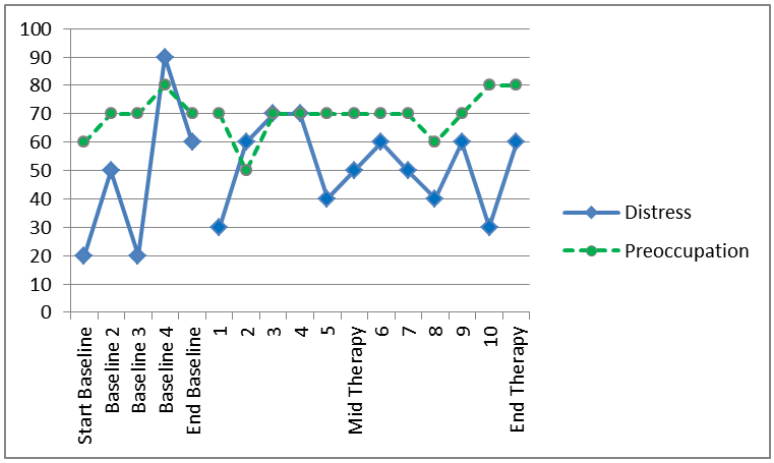


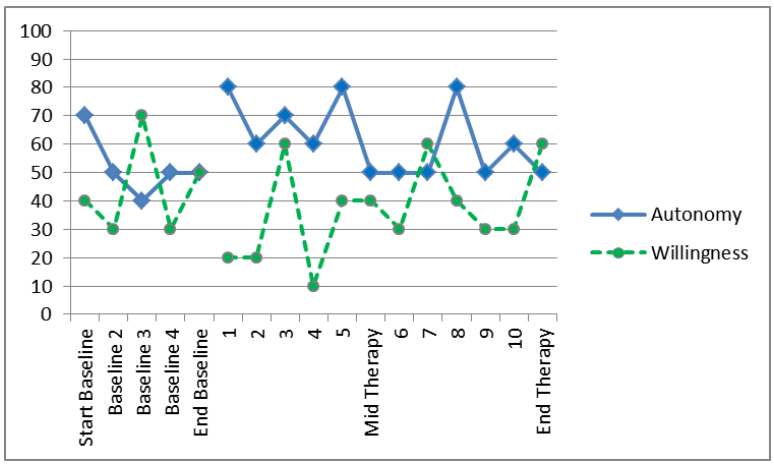




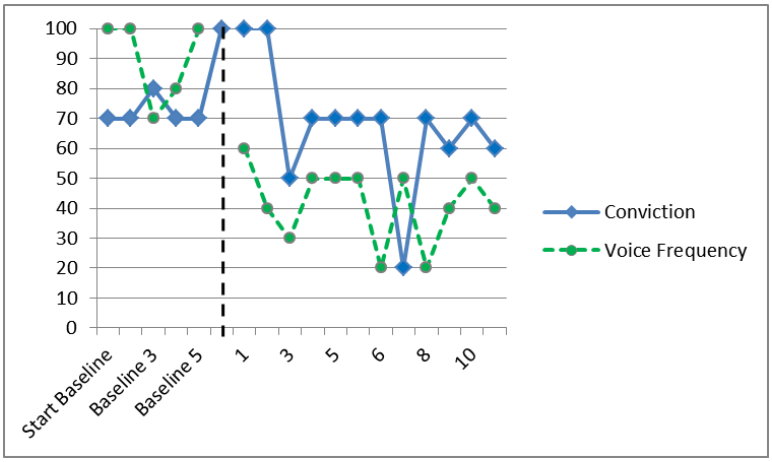
Participant 3 – "Charles"

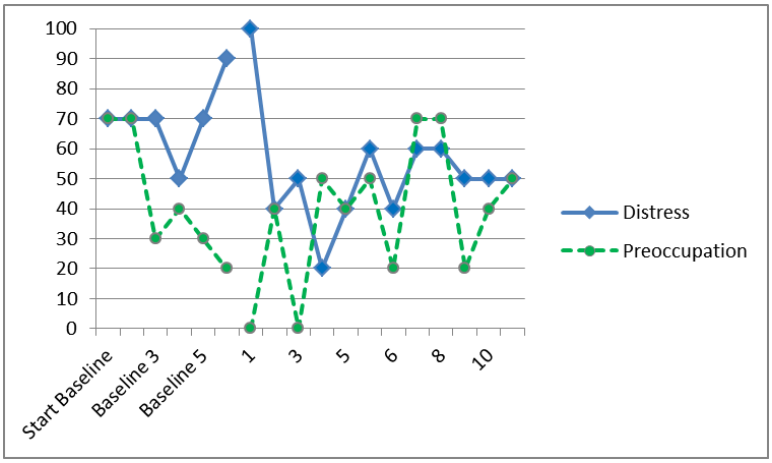


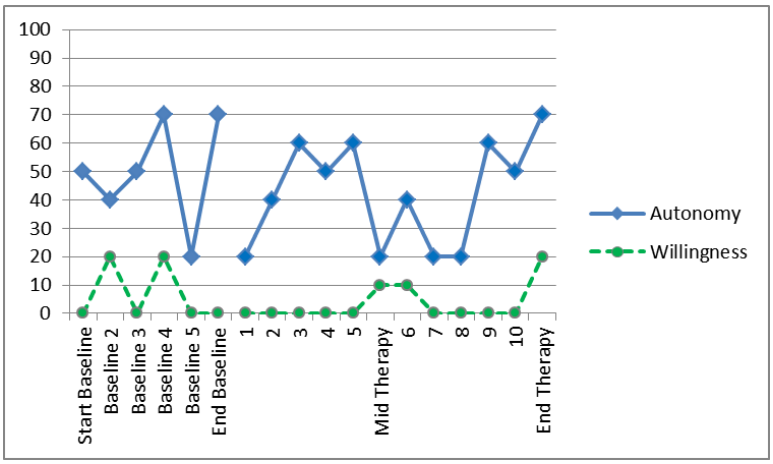




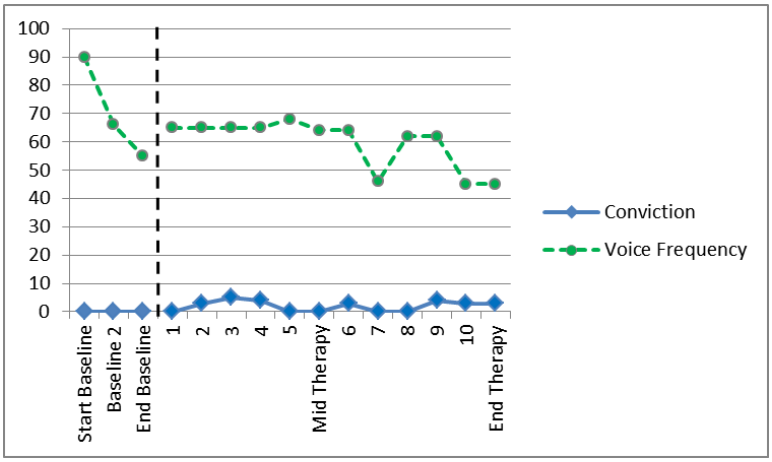
Participant 4 – "David"

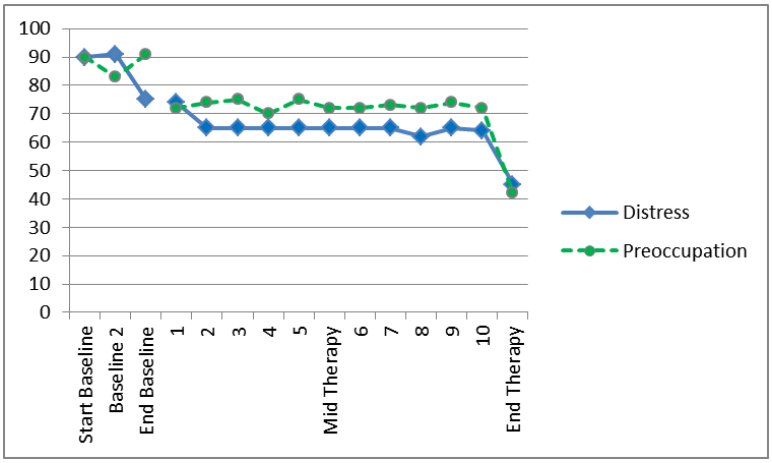


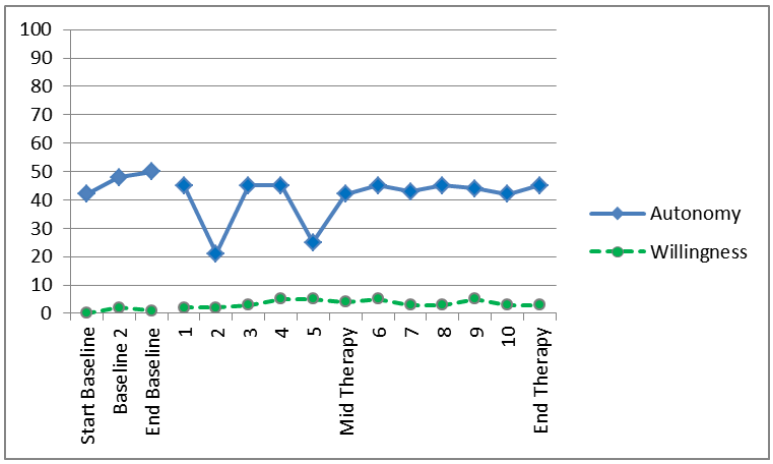




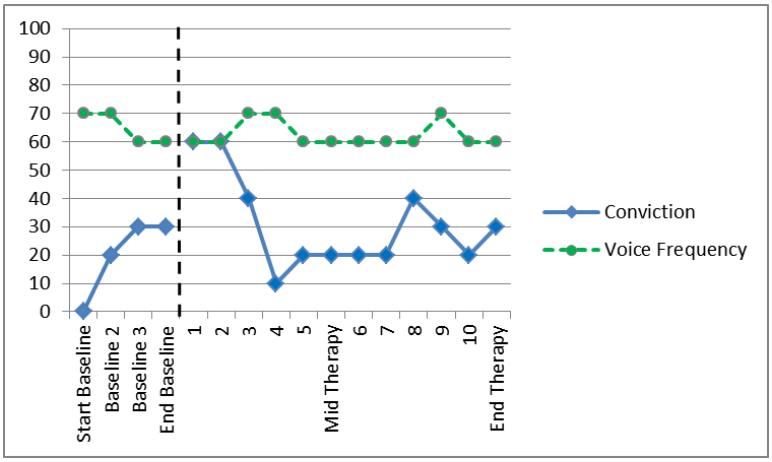
Participant 5 – "Edward"

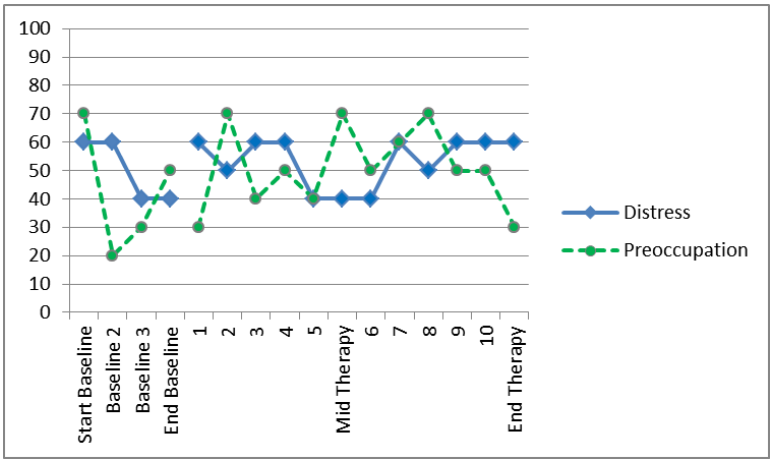


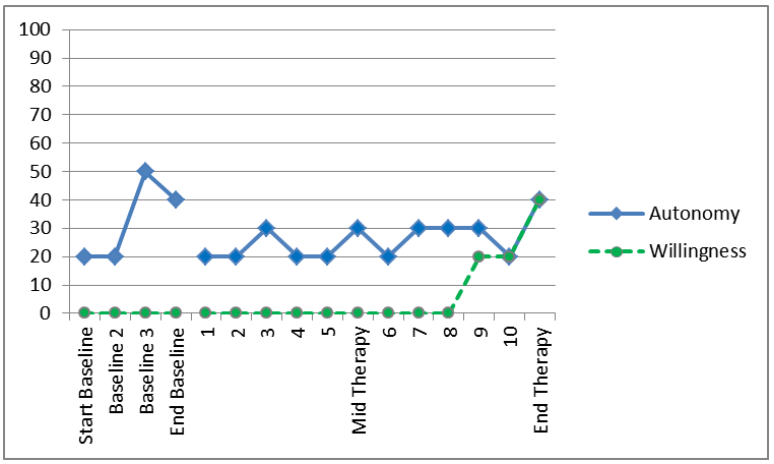




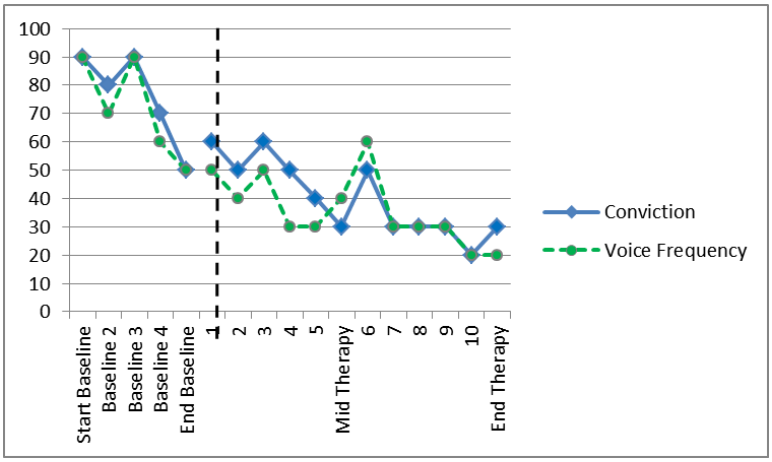
Participant 6 – "Fiona"

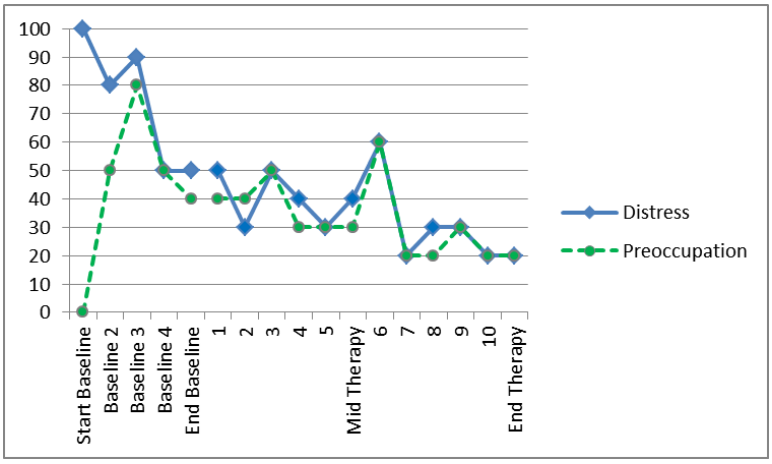


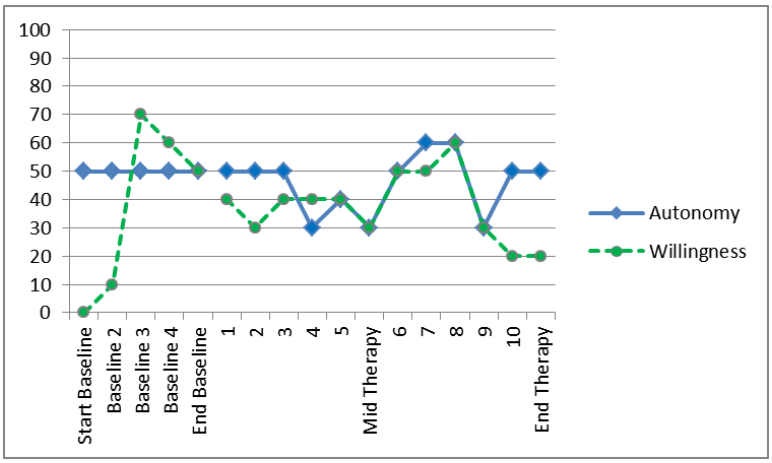




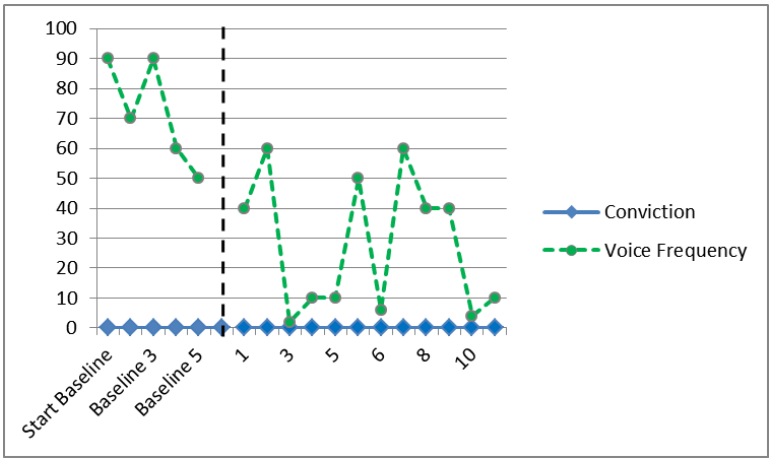
Participant 7 – "Grace"

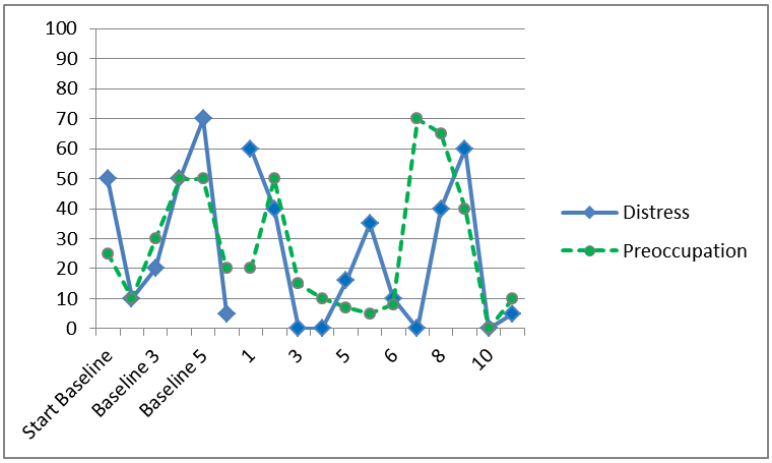


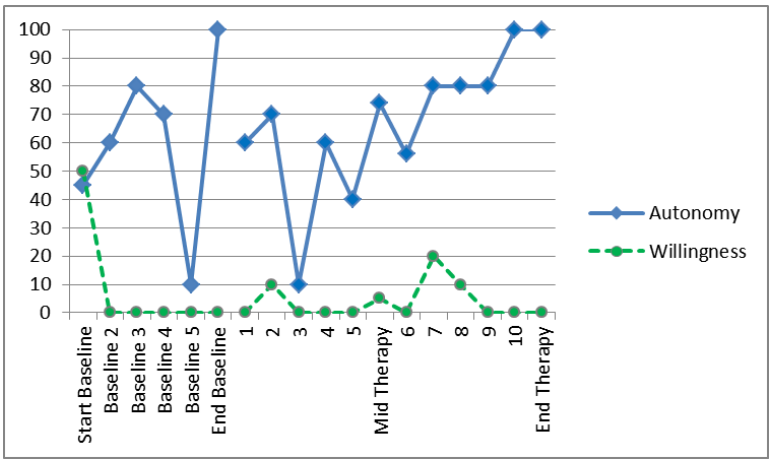




Participant 8 – "Heidi"







Appendix C

Appendix C1 Ethics Approval and Information Sheet for Study 3

Research Ethics Office

5.11 Franklin-Wilkins Building
(Waterloo Bridge Wing)
Stamford Street
London SE1 9NH
Tel 020 7848 4077/4070/4020
Email rec@kcl.ac.uk
www.kcl.ac.uk/research/ethics

KING'S College LONDON

Eric Morris
Lambeth Early Onset Services
332 Brixton Road
London
SW9 7AA

19 May 2011

Dear Eric

PNM/10/11-51 The effects of different coping strategies in an experimental analogue of auditory hallucinations.

Thank you for sending in the amendments requested to the above project. I am pleased to inform you that these meet the requirements of the PNM RESC and therefore that full approval is now granted with the following provisos:

1. We note that you intend to recruit through job centres in south London. Once you have confirmed the recruitment documents/advertisements to be used in these locations, submit these to the Research Ethics Office for approval.

Please ensure that you follow all relevant guidance as laid out in the King's College London Guidelines on Good Practice in Academic Research (http://www.kcl.ac.uk/college/policyzone/index.php?id=247).

For your information ethical approval is granted until **19 May 2012**. If you need approval beyond this point you will need to apply for an extension to approval at least two weeks prior to this explaining why the extension is needed, (please note however that a full re-application will not be necessary unless the protocol has changed). You should also note that if your approval is for one year, you will not be sent a reminder when it is due to lapse.

If you do not start the project within three months of this letter please contact the Research Ethics Office. Should you need to modify the project or request an extension to approval you will need approval for this and should follow the guidance relating to modifying approved applications: http://www.kcl.ac.uk/research/ethics/applicants/modifications.html

Any unforeseen ethical problems arising during the course of the project should be reported to the approving committee/panel. In the event of an untoward event or an adverse reaction a full report must be made to the Chairman of the approving committee/review panel within one week of the incident.

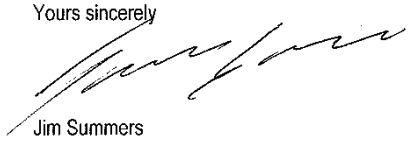
Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

If you have any query about any aspect of this ethical approval, please contact your panel/committee administrator in the first instance (http://www.kcl.ac.uk/research/ethics/contacts.html). We wish you every success with this work.

www.kcl.ac.uk

With best wishes

Yours sincerely



Jim Summers
Research Ethics Team Leader

c.c. Dr Emmanuelle Peters

INFORMATION SHEET FOR PARTICIPANTS

REC Reference Number: PNM/10/11-51

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

The effects of different coping strategies in an experimental analogue of auditory hallucinations

We would like to invite you to participate in this postgraduate research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

The aim of this research is to help us to understand how people cope with having auditory hallucinations (ie hearing voices). Auditory hallucinations are a common experience, with approximately 10% of the population having experienced hearing a voice at least once in their lifetime. People can hear voices in a variety of stressful situations; for example, following bereavement, or during periods of prolonged isolation or sleeplessness. Some people, unfortunately, find hearing voices a disruptive experience, which if voices persist, can lead to problems with their concentration, relationships and the ability to work. It seems that some people cope more effectively than others with hearing voices, and this study looks at how different ways of coping can affect a person's ability to achieve things.

We are interested in asking people who have not heard voices before to take part in an experiment where they will hear sounds that are similar to the experience of hearing voices, while completing a series of puzzles. The "voices" will be commenting on your performance during the experiment, which involves puzzles to do with problem-solving. Participants in the study will be trained in using one of three different strategies to cope with hearing voices by watching video clips on a computer.

If you decide to participate it may be that you find it stressful and/or frustrating to be hearing the comments that the voices make during the experiment: this is part of the study, and you are encouraged to persist with the task while using the coping strategy that has been suggested to you. The voices will be making comments about what you are doing as you complete the puzzles. This study will help us to understand how coping with voices can help people to succeed with goals, especially when hearing unpleasant and unwanted comments.

It is up to you whether you decide to take part in the study. If you give consent to take part you are free at any point to withdraw from the study, without any penalty.

The study is being done as part of a Doctor of Philosophy degree at the Institute of Psychiatry, King's College London.

<u>Who are we recruiting for the study?</u>

We are recruiting healthy adult volunteers from the community for this study (18 years of age or older). We are looking for participants who have not heard voices before, and are not currently troubled by symptoms of anxiety or depression (you will be asked about hearing voices, depression and anxiety symptoms when you meet with the researcher). We will exclude people who are currently depressed or anxious, as well as those who have heard voices, either currently or in the past. Similarly we will exclude people who have previously experienced an episode of psychosis. As the experimental task involves listening to sounds through headphones participants should have reasonable hearing.

What will happen if you agree to take part?

If you are interested in taking part in the study then the researcher will be in contact with you (by phone) to answer any questions you have about the study and go through this information sheet. The researcher will then ask you several screening questions to see if you meet the criteria for taking part in the study. The screening questions will include a questionnaire asking about your current mood, given over the telephone.

If you do not meet the eligibility criteria then none of the information you have given including the mood questionnaire will be retained by the researcher, it will all be destroyed.

If you are eligible to participate in the study and you decide to take part the researcher will arrange a suitable time to meet with you at the Institute of Psychiatry, King's College London. At this meeting the researcher will ask you if you give consent to take part in the study, you will be asked to sign a consent form and will commence the study.

After the consent form, you will be asked to complete questionnaires about your experiences and abilities. You will then be given instructions and a demonstration on a laptop computer of how to cope with voices, using a coping strategy that people use to get things done when they hear voices. You will then be encouraged to use this coping strategy while doing puzzles and hearing comments from the sound of "voices", heard through headphones. Next, you will be orientated to a series of written puzzles while listening to sounds through headphones. You will be instructed in how to complete the task, and how you can reduce the duration of the "voices" if you find them too much. Following these instructions you will be asked to complete the puzzles while hearing voices comment on your performance, and then give ratings following the tasks about how you found hearing the "voices". At the end of the experiment you will be given the opportunity to discuss how you found doing the puzzles and some more information about the research.

The experiment, including the time to do questionnaires, the computer instructions and puzzles, and a discussion about the research, will take up to an hour to complete. You will be paid £10 for the time spent completing the study.

It is up to you to decide whether to take part or not. If you decide to take part you are still free to withdraw at any time and without giving a reason. You will be able to withdraw your data up to point of finishing the experiment. As the data is then stored anonymously once the experiment is completed we will not be able to withdraw your responses to questionnaires, puzzles and computer responses at a later date.

Are there any risks in taking part in the study?

This study will involve hearing the sound of voices making comments about your performance while doing a series of puzzles. In the unlikely instance that taking part does produce lingering unpleasant feelings a telephone number will be provided to you to call up to a week later for support and advice (from the researcher).

This study will also involve you completing questionnaires that will ask you about your current mood, how you deal with your own thoughts and feelings, as well as how often you have experiences that people can find odd or unusual. You will also be asked to do a brief test of intellectual ability. It may be that these questionnaires will bring up concerns and issues for you; these can be discussed with the researcher, who will be able to advise you on what to do.

Possible benefits

This study may help you to understand what it is like to hear voices and how some people find it difficult to cope with this experience, particularly in trying to get things done from day to day.

When the study has finished, a full report will be written of the results. This report will be written in a non-technical way, and will be available to those participating, if you would like to find out the study conclusions.

Arrangements for ensuring anonymity and confidentiality

All of the information taken in the study (questionnaires and ratings, responses on the computer) will be anonymous; we do not require you to provide any identifying information to participate in the study. Anonymised questionnaires and data files produced from the computer will be stored at the researcher's place of work.

The signed consent forms for the study will be stored in a locked filing cabinet at the researcher's place of work.

If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

The anonymised results of this study are planned to be written up as part of the researcher's dissertation for a doctor of philosophy degree at King's College London. It is also planned that the study report will be submitted for publication in a peer-reviewed scientific journal.

Name and contact details of the researcher

The researcher for this study is Eric Morris, a PhD student at the Department of Psychology, Institute of Psychiatry, King's College London.

His contact details are: Eric Morris, Consultant Clinical Psychologist, Lambeth Early Onset Services, South London & Maudsley NHS Foundation Trust, 332 Brixton Road, London SW9 7AA. Phone: 020 3228 6940. (Email: Eric.Morris@kcl.ac.uk)

It is up to you to decide whether to take part or not. If you decide to take part you are still free to withdraw at any time and without giving a reason.

If this study has harmed you in any way you can contact King's College London using the details below for further advice and information:

Dr Emmanuelle Peters, Senior Lecturer in Clinical Psychology & Honorary Consultant Clinical Psychologist, Department of Psychology, PO77, HWB, King's College London, Institute of Psychiatry, De Crespigny Park, London SE5 8AF (Email: Emmanuelle.Peters@kcl.ac.uk). Ph: 020 7848 0347

CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

KING'S College LONDON

Title of Study: The effects of different coping strategies in an experimental analogue of auditory hallucinations

King's College Research Ethics Committee Ref: PNM/10/11-51

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

	Please tick or initial
• I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to the point of completing the experiment.	☐
• I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the Data Protection Act 1998.	☐
• The information you have submitted will be published as a report and you will be sent a copy. Please note that confidentiality and anonymity will be maintained and it will not be possible to identify you from any publications.	

Participant's Statement:

I _____

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed **Date**

Investigator's Statement:

I _____

Confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed **Date**

Appendix C-2 Comments for Voices Stimuli

Critical Comments

1. Stupid
2. Fool
3. Useless.
4. Rubbish.
5. Loser.
6. Idiot
7. Stupid, stupid, stupid.
8. Fool, fool, fool.
9. Useless, useless, useless.
10. Rubbish, rubbish, rubbish.
11. Loser, loser, loser.
12. Idiot, idiot, idiot.
13. You are stupid.
14. You are an idiot.
15. You are useless.
16. You are a fool.
17. You are rubbish.
18. You are a loser.
19. That was stupid.
20. That was useless.
21. That was rubbish.
22. That was foolish.
23. This is stupid.
24. This is useless.
25. This is rubbish.
26. You are too stupid.
27. You are useless at doing this.
28. You are rubbish at doing this.
29. What a loser.
30. What an idiot.
31. You are so useless.
32. You are so stupid.
33. I wouldn't have done that.
34. You are going the wrong way.
35. You'll never get this done.
36. People will know that you have failed this task.
37. I would give up if I were you.
38. There is no point going on.
39. This is a stupid test anyway, you may as well stop.
40. Why don't you give up?
41. You are fooling no-one: you are hopeless at this task.
42. This is the dumbest I have seen anyone do at this task.
43. Why try at doing this? You are useless.
44. Some people can do this, but not you.
45. The best thing you can do is give up.
46. You’re pathetic.

47. You're doing this wrong.
48. That was a mistake.
49. You'll never get this done.
50. That was hopeless.
51. You are very slow.
52. Absolutely useless.
53. Absolutely hopeless.
54. Absolutely pathetic.
55. You are too stupid to do this.
56. You are making some serious mistakes.
57. You are going the wrong way.
58. You are lost.
59. You are a failure.
60. What a mess.
61. What a mess you are making.
62. Pathetic.
63. You are clueless.
64. Slow.
65. That was feeble.
66. Failure.
67. You are thick.
68. You are dumb.
69. You're making lots of errors.
70. Terrible.
71. This is silly.
72. This is futile.
73. You are quite muddled.
74. You're getting confused.
75. This is pointless.

<u>Paranoia statements</u>

1. The experimenter is doing this to make you look stupid.
2. Don't trust the experimenter.
3. This experiment is a set-up.
4. The experiment is a fake.
5. The experiment is a giant "con".
6. The experiment is just to make you fail.
7. The experimenter has been lying to you.
8. Keep on guard, this experiment is a fake/ set up/ a fraud/ a trick.
9. Your every move is being watched.
10. You are on "candid camera" right now.
11. This is going to end up on the internet.
12. The experimenter is making fun of you.
13. You are being set up to fail by the experimenter.
14. Don't do what they say

Appendix C-3 Quality Criteria for analogue studies

Based upon the recommendations of Barnes-Holmes and Hayes (2005), sourced from:

http://contextualpsychology.org/how_to_do_act_laboratory_based_component_studies

Recommendation	**Current study component**
1. The experimenter should be blind to the intervention applied to each participant (or the procedure automated; see below).	The experimenter was blind to the intervention taught to participants, due to the experiment being automated.
2. The experimental conditions must balance as much as possible for all relevant attribute variables (e.g., gender, psychopathology, unless the attribute(s) is the target of the analysis).	Allocation was randomised for all participants. Conditions did not show significant differences on demographic and potential moderating variables (refer to Results section).
3. The experimenter should not be personally familiar with the participants and if they are, familiarity should be balanced across conditions.	The experimenter was not personally familiar with the participants, due to the recruitment process.
4. The different interventions should be balanced in all possible ways, except for the critical difference you are seeking to manipulate (e.g., they should be the same length; they require similar levels of engagement with the material; if exercises are used that are appropriate for both conditions, they should be used in both; working should be matched where possible; method of delivery should be identical; etc).	The three conditions were balanced in terms of: • Word- and instruction-length • A common metaphor used across all conditions • The method of delivery was identical • Similar levels of engagement required
5. The interventions should connect directly to the experimental challenge. In a pain tolerance study, for example, each of the interventions should focus on pain not anxiety or anger etc. (unless different foci are the target of the study).	The intervention instructions connected directly to coping with negative comments from external voices.
6. Points 4 and 5 should be checked and supported by independent raters.	The instructions for the conditions were rated by independent raters (see Method section).
7. Where possible and appropriate, the procedure should involve requiring participants to articulate in their own words the intervention strategy that is being provided. Ideally this should be done at regular points throughout the intervention.	The participants were asked to provide a description in their own words following the coping instruction.

Recommendation	Current study component
8. The verbal material produced under point 7 should be checked by independent raters to determine that participant “understanding” did not differ significantly across conditions, and to ensure that the manipulation successfully altered the intended process.	These statements were checked by independent raters
9. Participants should be reminded briefly of the relevant intervention strategy before the presentation of each physical or psychological challenge (e.g., CO2 inhalation, electric shock delivery, emotionally aversive pictures or video clips, spider BAT, etc).	Participants were reminded to use the trained coping strategy prior to starting the mazes task; however, were not reminded during the task.
10. Ideally, the entire procedure, including pre-intervention baseline, intervention, and post-intervention tasks should be automated. For example, the intervention could be presented via audio or video clips and these can then be checked by independent raters. Moreover, others can then take your automated procedure and attempt to replicate in a different lab. If automation is not possible, then EVERY session should be videotaped to check for fidelity. If only some sessions are videotaped, then the experimenter should NOT know which ones.	The entire procedure for the experimental task was automated, using a computer program and video clips for the instructions.
11. All participants should be asked to summarize at the very end of the experiment the strategy they employed during the study and these can be checked by independent raters.	Post-task, participants were asked to summarise what coping strategy they used within the experiment. These statements were then classified by independent raters, to determine adherence to the experiment instructions.
12. Other questions can also be asked, in which the participant rates features such as the like-ability of the experimenter (including any video- or audio-based material), expectation for performance on the task, relevance of intervention to "real life", etc.	This was not a feature of this study.
13. Ideally, some form of standardized self-report instrument should be developed to measure the extent to which participants understand and apply specific strategies.	This was not a feature of this study.

Recommendation	Current study component
14. For ACT / RFT studies the design of the protocols should be tied to RFT concepts. Studies should not just grab a metaphor or exercise without working through how the metaphor/exercise is predicted, theoretically, to influence the participants' responses in your study.	The use of the Swamp Metaphor was influenced by the previous use of this metaphor in studies by Kehoe et al . In relational frame theory terms the use of the metaphor was designed to do the following in each condition: • Acceptance – transform the stimulus functions of critical comments to an experience to be approached, rather than struggled with (needing to be controlled) • Reappraisal – a contextual cue to elicit efforts to respond relationally – find alternate meaning • Suppression – transform the stimulus functions of critical comments to an experience that needs to be controlled/ eliminated as inconsistent with goal (i.e., completing mazes).
15. If the study is a group design it should be adequately powered to test the key hypotheses, especially if null results are to be meaningful. For example, if an interaction is possible, each individual cell size must have a large enough N to test that interaction at an adequate level (say, power of .8 assuming a sensible effect size)	The study power was adequate to test the key hypotheses of differences in responding between the three conditions. The study was under-powered to detect interactions.
16. If mediational analyses are important, the study must be powered to test these analyses.	Mediational analyses were not a feature of this study.
17. Especially if null results are predicted, make sure the actual measurement characteristics, outliers, and similar issues do not undermine the calculated power.	Null results were not predicted.

Appendix C-4 Experiment Instruction Scripts

Participants were trained in the allocated coping strategy using an automated process on a laptop computer. Instructions were provided using video clips triggered by a program, which featured a female trainer speaking directly to camera. Participants listened to the instructions through a set of headphones.

Experiment Introduction (played to all participants)

"Welcome to the Hearing Voices Experiment – thank you very much for agreeing to participate. Your involvement in this experiment will help us to understand better how people cope with hearing voices, while getting important things done in their lives.

During this next part of the experiment you will have an experience similar what it is like to hear voices. Hearing voices is a common experience; approximately 10% of people hear a voice at least once in their lifetime.

Many times people hear voices when they are in stressful situations. For example, following a bereavement a person may hear the voice of their loved one who has died. Similarly people who have experienced intense periods of isolation or sleeplessness have found that they start to hear voices. In very stressful situations such as being taken hostage, or being put in solitary confinement, it is common to start to hear voices without other people being around.

For many people hearing voices can be a puzzling and disturbing experience, and if the voices persist for a length of time, this can lead to big problems with being able to concentrate, relate to other people, and carry out tasks at work and home. Unfortunately hearing voices can sometimes lead to people being seriously disabled, finding it difficult to cope with daily life and being scared of what the voices may say to them about what they are doing and thinking.

It seems that some people can cope better than others with hearing voices, and this experiment is looking at why this might be the case. Your participation is therefore very important in helping us understand this problem better.

You are going to be completing a series of mazes while hearing comments about your performance. You may find it stressful or frustrating to hear what the voices are saying, but we would like you to try your best with the tasks given; the better you can do this, the more we will understand how to help people who are disabled by hearing voices.

We will also teach you a way of coping with hearing voices: it is important that you try to use this skill while doing the experiment.

We would like you to do your best in the experiment by completing as many mazes as you can.

You will be getting points for every maze that you complete: by working to get a high score, this will make sure that the experiment is most useful in understanding how hearing voices can be a serious problem.

Finally, thank you again for agreeing to participate: by doing this experiment you are assisting us to find better ways to really help people who hear voices.

In the next clip I will next teach you a way of coping with hearing voices. "

Coping Strategy Instructions (participants watched one of three, randomly allocated)

<u>Reappraisal</u>

"*In the experiment you will hear voices making comments about what you are doing – if you find these comments create barriers to doing your best then we encourage you to use the following coping strategy.*

If you have upsetting thoughts and feelings about hearing the voices, then we would like you to deliberately try other ways of thinking about this situation. So, imagine hearing voices' comments about what you are doing and having irritable thoughts (for example, 'I can't concentrate with this') or being down on yourself (for example, 'I'm rubbish at this task'). The best thing to do is to take a different perspective on these thoughts; this will change what they mean to you and enable you to get on with the task.

There are several ways to think differently about the situation and the voices that should help you to succeed at the task.

For example:

You could look at whether your thoughts about hearing the voices are biased toward a negative view: could there be another, more helpful way of thinking about this? Perhaps you are being too hard on yourself, or you are concentrating on the annoying aspects of the situation. Instead, you could try telling yourself that it's quite normal to feel the way you do under the circumstances, and to give yourself a break. You could also remind yourself that in the grand scheme of things this is not that bad, and you have successfully finished difficult tasks before. By drawing upon your experience of how you have dealt with other difficult tasks you can remind yourself that there is likely to be another way of looking at things.

In other words, try to find another way of thinking about the voices if the comments upset you or get in the way of finishing.

You could try to work out what it is that's upsetting you about the situation (for example, what the voices are saying, or how you are judging yourself), and ask yourself whether it's really true. For instance, are the voices telling the truth? Is your judgement of your performance realistic? How would you advise someone else about how to think or do about this situation? How would a neutral observer regard this situation? There are many times in life when we are upset by things

that, when looked at more realistically, are not as bad as they first seem.

In other words, try to question how accurate your thoughts are, so that you may be able to be less bothered by the voices.

You can try reminding yourself of why you are doing this in the first place; for example, because you are getting paid, or because it will help other people, or just because you are curious about psychology, or whatever your personal reasons are. Try 'egging' yourself along by telling yourself it won't last long, or that you can do this, or that it's not that bad really, or any other 'self-statement' that helps you to cope with the situation.

In other words, try to remind yourself of your reasons for doing this, which can provide a better perspective on the situation and help you get the task done.

So, to summarise, we would like you to approach the experiment in this way: if you have upsetting thoughts about the voices that seem to get in the way of doing the task, please handle them by reminding yourself that there are other ways of thinking that will be less distressing and more helpful in getting the job done.

By seeing the situation in another way when comments from the voices are upsetting you can succeed at the task."

<u>Suppression</u>

"*In the experiment you will hear voices making comments about what you are doing – if you find these comments create barriers to doing your best then we encourage you to use the following coping strategy.*

If you have upsetting thoughts and feelings about hearing the voices, then we would like you to deliberately block them out and make sure they don't interfere with the task.

So, imagine hearing the voices make comments about what you are doing and having irritable thoughts (for example, 'I can't concentrate with this') or being down on yourself (for example, 'I'm rubbish at this task'). The best thing to do is to make sure you actively keep the voices' comments from your mind and not let them get to you, behaving as though you are not bothered. You will be able to succeed at the task by controlling how much these experiences trouble you and intrude on what you are doing.

There are several ways to block things out that that should help you to succeed at the task.

For example:

Try to actively obstruct the voices and what they are saying. Don't let the words the voices are saying come into your mind; don't pay any attention to the sound of the voices.

In other words, push away the experience of the voices, so that they do not get in the way of you doing what you need to do. By making sure you don't listen to the voices, this will help you get through the task.

If you do find the voices upsetting then we would like you to keep these thoughts and feelings under control by pushing them out of your mind. It is a case of mind over matter, and staying in control of your thoughts and feelings is the best way to get through the task. Remember that there have been times in your life when you have put a lid on your feelings in order to get important things done. By stopping unhelpful thoughts and feelings you will not let them get to you. You can do the same thing in this task when the voices are making comments to upset you – just focus on keeping your thoughts and feelings in check and under control.

In other words, you can block out upsetting or unhelpful thoughts and feelings from your mind: what matters is doing the task and making sure your thoughts and feelings do not get in the way.

Finally, focus your mind on just what you are doing, and nothing else: try to concentrate on the task at hand, and use your will power to ignore anything else that is happening (like voices, feelings or upsetting thoughts). Try 'egging' yourself along by using "self-statements" that will help you to focus and prevent feelings from intruding. You can tell yourself not to listen to the voices, or not to pay attention to your thoughts and feelings, or not to let them get to you: any statement that helps you to keep a lid on your feelings, and allows you to make the task the focus.

In other words, use your will power to focus on doing well, preventing voices and feelings from distracting you, and motivate yourself to make sure you stay in control.

So, to summarise, we would like you to approach the experiment in this way: if you have upsetting thoughts about the voices that seem to get in the way of doing the task, please handle them by blocking them out and keeping them from your mind.

By actively preventing and stopping unhelpful thoughts and feelings that happen when comments from the voices are upsetting you can succeed at the task."

Acceptance

"I*n the experiment you will hear voices making comments about what you are doing – if you find these comments create barriers to doing your best then we encourage you to use the following coping strategy.*

If you have upsetting thoughts and feelings about hearing the voices, then we would like you to choose to have these experiences and let them be, making room and being open to them, while going forward in the direction you planned to go. So, imagine hearing the voices make comments about what you are doing and having irritable thoughts (for example, 'I can't concentrate with this') or being down on yourself (for example, 'I'm rubbish at this task'). The best thing to do is to notice that you got hooked into struggling, and choose to make room for these voices and thoughts; this will enable you to get on with the task.

There are several ways to make room for your experiences that should help you to succeed at the task.

For example:

Imagine that the task is like going on a journey to a beautiful mountain you can see clearly in the distance. However, no sooner do you start walking toward the mountain than you walk right into a swamp that extends as far as you can see, in all directions. The swamp is full of dirt, rubbish and leftovers that look and smell really bad.

You say to yourself "I didn't realise I was going to have to go through a swamp. It's all smelly, and the mud is all mushy in my shoes. It's hard to lift my feet out of the muck. I'm wet and tired. Why didn't anybody tell me about this swamp?" When that happens, you have a choice: to abandon the journey, or enter the swamp. Life is like this. We go into the swamp, not because we want to get muddy, but because it stands between us and where we are wanting to go.

While being in the swamp it's likely that thoughts such as "This is unpleasant. This is boring." or ""It's not worth the effort.", or "It's nonsense" may all show up. The best way through the swamp is for you to notice these experiences and let them be, being open to them while going forward in the direction you planned to go.

Similarly, if you find the voices upsetting, then try to notice these thoughts as experiences you are having in the moment. By making room for your experiences, you can walk through the swamp.

You could freely let your feelings and thoughts go in whatever direction they want to, while moving forward in the swamp. We would like you to practice choosing to experience what you are experiencing, being open to it, not fighting it or needing it to be different than it is; this will get you through the task. Being open to experiences will allow you to remain flexible and get the task done. It is understandable to have thoughts and feelings about what you are doing: this is what our minds do; in this task choose to have these experiences, giving them permission to be there, as they happen.

So, to summarise, we would like you to approach the experiment in this way: if you have upsetting thoughts about the voices that seem to get in the way of doing the task, please handle them by gently observing these voices, feelings and thoughts and letting them be there, as you would if you were going through a swamp to get where you want to go.

By choosing to be open to your experiences when comments from the voices are upsetting you

can succeed at the task. "

All participants were additionally instructed that they had the option to reduce the volume of the voice by pressing a mouse button attached to the computer:

"Finally, if you are finding it too difficult or distressing to hear the voices while you are doing the mazes, then you are able to stop them.

You can do this by steadily pressing the mouse button, located a short distance from you.

By pressing the button a number of times the voices will stop, for a period of time, before starting back again. This will give you a short break from hearing them.

This button will work throughout the experiment; just get up to press it, if you need to."

Appendix C-5 **Examples of a Mazes booklet, used as the experimental task**

Mazes sourced from: http://www.onebillionmazes.com/

INSTRUCTIONS

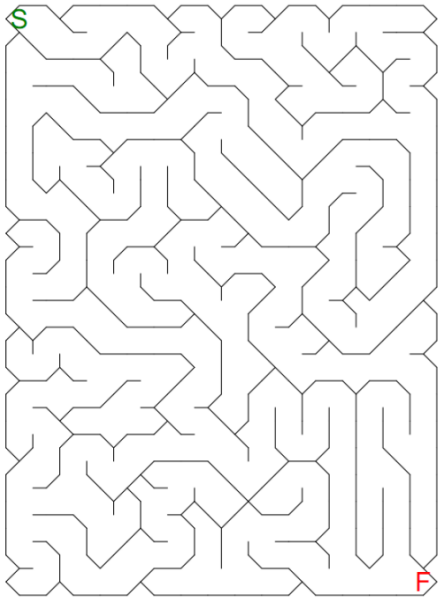
Please complete as many of the mazes in this booklet as you can, in order.

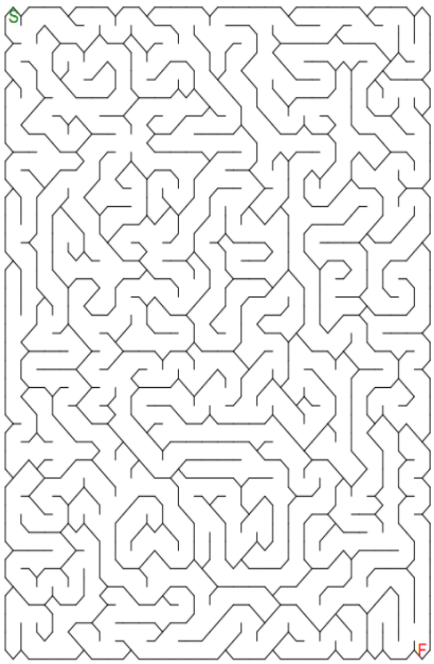
Use the pen provided to trace a path from the start to the finish.

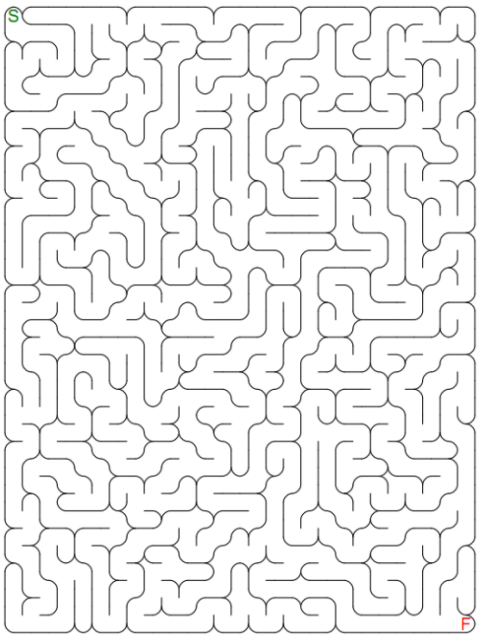
If you make a mistake, simply go back to an earlier point and complete the maze from there.

There is no need to cross out or correct when you have made an error.

Use the coping strategy you have been taught to help you complete as many mazes as you can.







Appendix C-6 Study Measures

Appendix C-6.1 Hospital Anxiety and Depression Scale (HADS)

Hospital Anxiety and Depression Scale (HADS)

Participant # ☐☐☐

A	**I feel tense or 'wound up':**	
	Most of the time	3
	A lot of the time	2
	From time to time, occasionally	1
	Not at all	0

D	**I still enjoy the things I used to enjoy:**	
	Definitely as much	0
	Not quite so much	1
	Only a little	2
	Hardly at all	3

A	**I get a sort of frightened feeling as if something awful is about to happen:**	
	Very definitely and quite badly	3
	Yes, but not too badly	2
	A little, but it doesn't worry me	1
	Not at all	0

D	**I can laugh and see the funny side of things:**	
	As much as I always could	0
	Not quite so much now	1
	Definitely not so much now	2
	Not at all	3

A	**Worrying thoughts go through my mind:**	
	A great deal of the time	3
	A lot of the time	2
	From time to time, but not too often	1
	Only occasionally	0

D	**I feel cheerful:**	
	Not at all	3
	Not often	2
	Sometimes	1
	Most of the time	0

A	**I can sit at ease and feel relaxed:**	
	Definitely	0
	Usually	1
	Not Often	2
	Not at all	3

D	I feel as if I am slowed down:	
	Nearly all the time	3
	Very often	2
	Sometimes	1
	Not at all	0

D	I look forward with enjoyment to things:	
	As much as I ever did	0
	Rather less than I used to	1
	Definitely less than I used to	2
	Hardly at all	3

A	I get a sort of frightened feeling like 'butterflies' in the stomach:	
	Not at all	0
	Occasionally	1
	Quite Often	2
	Very Often	3

A	I get sudden feelings of panic:	
	Very often indeed	3
	Quite often	2
	Not very often	1
	Not at all	0

D	I have lost interest in my appearance:	
	Definitely	3
	I don't take as much care as I should	2
	I may not take quite as much care	1
	I take just as much care as ever	0

D	I can enjoy a good book or radio or TV program:	
	Often	0
	Sometimes	1
	Not often	2
	Very seldom	3

A	I feel restless as I have to be on the move:	
	Very much indeed	3
	Quite a lot	2
	Not very much	1
	Not at all	0

Appendix C- 6.2 Emotion Regulation Questionnaire

ERQ Participant # ☐☐☐

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1----------2----------3----------4----------5----------6----------7
strongly disagree neutral strongly agree

1. ____ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
2. ____ I keep my emotions to myself.
3. ____ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
4. ____ When I am feeling *positive* emotions, I am careful not to express them.
5. ____ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
6. ____ I control my emotions by *not expressing them*.
7. ____ When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.
8. ____ I control my emotions by *changing the way I think* about the situation I'm in.
9. ____ When I am feeling *negative* emotions, I make sure not to express them.
10. ____ When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

Appendix C- 6.3 Oxford - Liverpool Inventory of feelings and experiences (O-life

Participant # ☐☐☐

Oxford - Liverpool Inventory of feelings and experiences (O-life)

Please Read the Instructions Before Continuing:

This questionnaire contains questions that may relate to your thoughts, feelings, experiences and preferences. There are no right or wrong answers or trick questions so please be as honest as possible. For each question place a circle around either the "YES" or the "NO". Do not spend too much time deliberating any question but put the answer closest to your own.

Please do not discuss the questionnaire with anyone who may also complete it as this may affect their answers. It is best completed in private, without the need to hurry.

1. When in the dark do you often see shapes and forms even though there's nothing there?	YES	NO
2. Are your thoughts sometimes so strong that you can almost hear them?	YES	NO
3. Have you ever felt that you have special, almost magical powers?	YES	NO
4. Have you sometimes sensed an evil presence around you, even though you could not see it?	YES	NO
5. Do you think you could learn to read other's minds if you wanted to?	YES	NO
6. When you look in the mirror does your face sometimes seem quite different from usual?	YES	NO
7. Do ideas and insights sometimes come to you so fast that you cannot express them all?	YES	NO
8. Can some people make you aware of them just by thinking about you?	YES	NO
9. Does a passing thought ever seem so real it frightens you?	YES	NO
10. Do you sometimes feel that your accidents are caused by mysterious forces?	YES	NO
11. Do you ever have a sense of vague danger or sudden dread for reasons that you do not understand?	YES	NO
12. Does your sense of smell sometimes become unusually strong?	YES	NO

13. Are you easily confused if too much happens at the same time?	YES	NO
14. Do you frequently have difficulty in starting to do things?	YES	NO
15. Are you a person whose mood goes up and down easily?	YES	NO
16. Do you dread going into a room by yourself where other people have already gathered and are talking?	YES	NO
17. Do you find it difficult to keep interested in the same thing for a long time?	YES	NO
18. Do you often have difficulties in controlling your thoughts?	YES	NO
19. Are you easily distracted from work by daydreams?	YES	NO
20. Do you ever feel that your speech is difficult to understand because the words are all mixed up and don't make sense?	YES	NO
21. Are you easily distracted when you read or talk to someone?	YES	NO
22. Is it hard for you to make decisions?	YES	NO
23. When in a crowded room, do you often have difficulty in following a conversation?	YES	NO
24. Are there very few things that you have ever really enjoyed doing?	YES	NO
25. Are you much too independent to really get involved with other people?	YES	NO
26. Do you love having your back massaged?	YES	NO

27. Do you find the bright lights of a city exciting to look at?	YES	NO
28. Do you feel very close to your friends?	YES	NO
29. Has dancing or the idea of it always seemed dull to you?	YES	NO
30. Do you like mixing with people?	YES	NO
31. Is trying new foods something you have always enjoyed?	YES	NO
32. Have you often felt uncomfortable when your friends touch you?	YES	NO
33. Do you prefer watching television to going out with other people?	YES	NO
34. Do you consider yourself to be pretty much an average kind of person?	YES	NO
35. Would you like other people to be afraid of you?	YES	NO
36. Do you often feel the impulse to spend money which you know you can't afford?	YES	NO
37. Are you usually in an average sort of mood, not too high and not too low?	YES	NO
38. Do you at times have an urge to do something harmful or shocking?	YES	NO
39. Do you stop to think things over before doing anything?	YES	NO
40. Do you often overindulge in alcohol or food?	YES	NO
41. Do you ever have the urge to break or smash things?	YES	NO
42. Have you ever felt the urge to injure yourself?	YES	NO
43. Do you often feel like doing the opposite of what people suggest, even though you know they are right?	YES	NO

Appendix C- 6.4 Cardiff Anomalous Perceptions Scale

CAPS

Participant # ☐☐☐

Introduction

This questionnaire asks questions about sensations and perceptions you may have experienced. Some of the experiences are unusual, some of them are more everyday.

We realise circling answers may not always represent your experience as accurately as you might like. However, we would ask you to circle the answers that most closely match your experience and avoid missing any questions out.

We would appreciate it if you could be as honest as possible when giving your answers.

The only experiences we are not interested in are those that may have occurred whilst under the influence of drugs.

Instructions

Each item has a question on the left hand side. Please read the question and circle either YES or NO

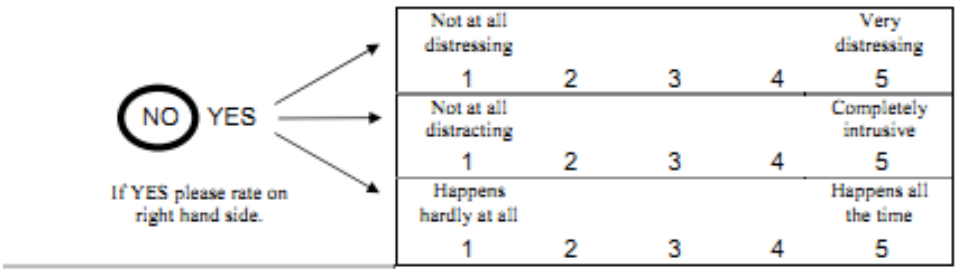
- If you circle **NO** please move straight on to the next question.
- If you circle **YES** please rate the experience *in all of the three boxes* on the right hand side of the item by circling a number between 1 and 5.

These ask about how distressing you found the experience, how distracting you found it, and how often the experience occurs.

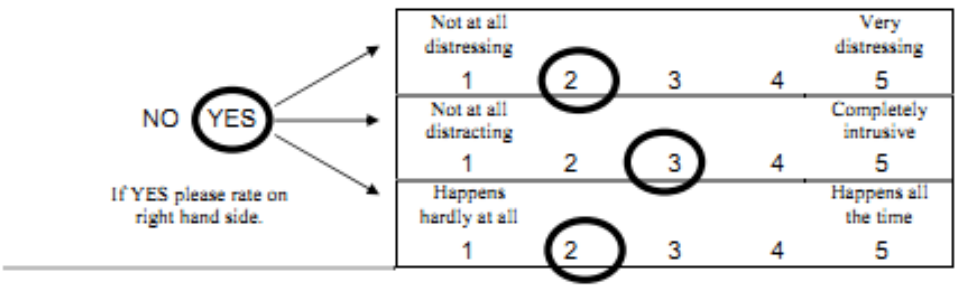
Example questions

You do not need to answer these questions, they are just examples to illustrate the instructions.

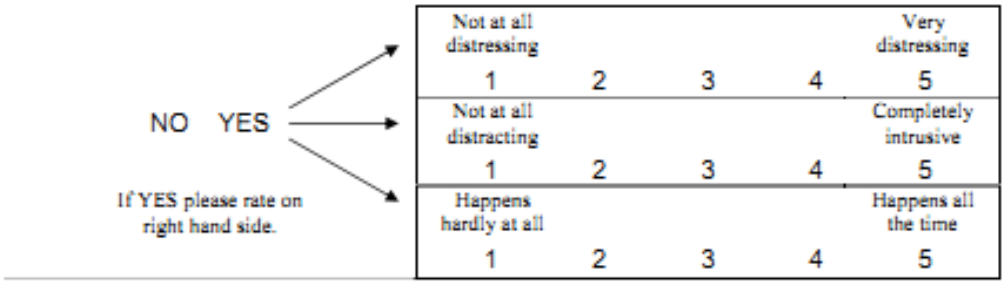
Do you ever notice that lights seem to flicker on and off for no reason ?



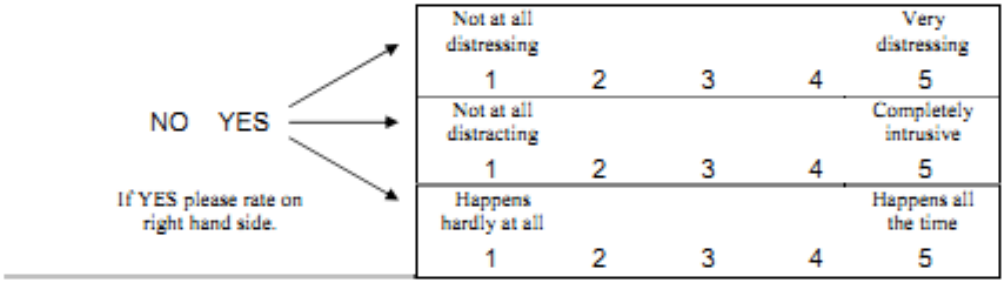
Do you ever feel that the sound on the TV or radio seems unusually quiet ?



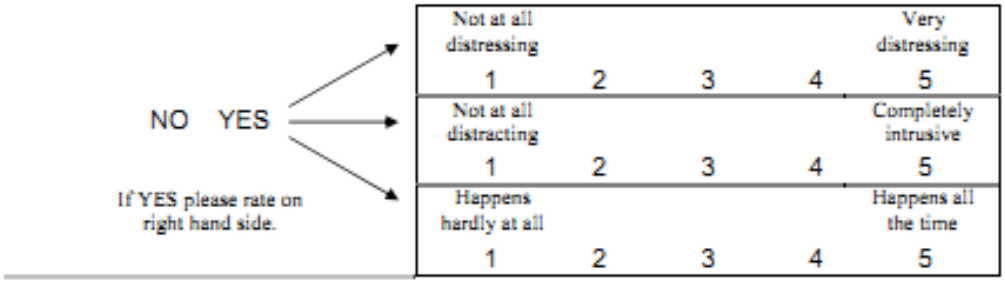
1) Do you ever notice that sounds are much louder than they normally would be ?



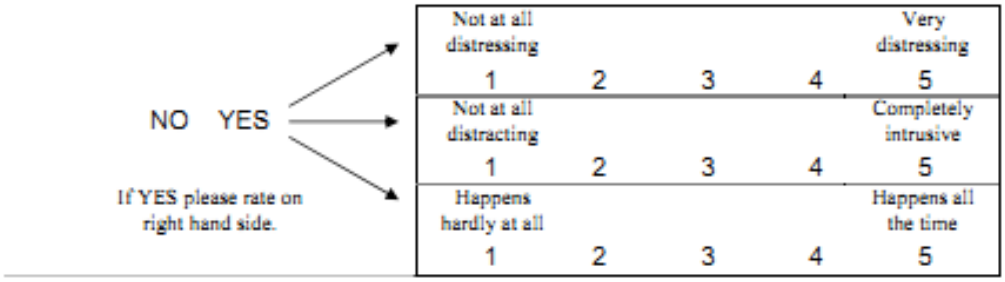
2) Do you ever sense the presence of another being, despite being unable to see any evidence ?



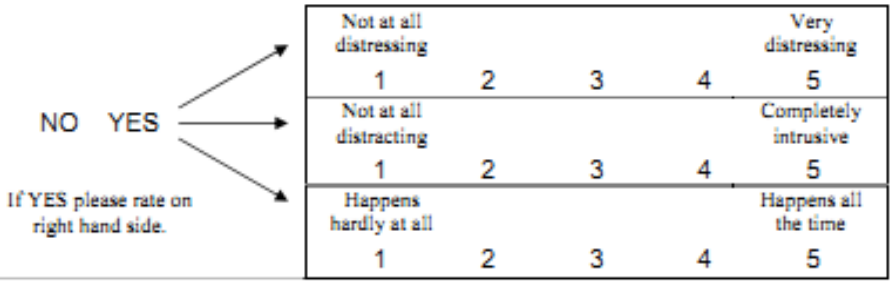
3) Do you ever hear your own thoughts repeated or echoed ?



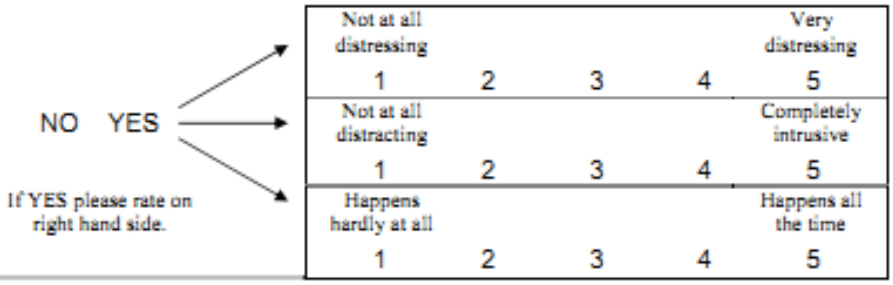
4) Do you ever see shapes, lights or colours even though there is nothing really there ?



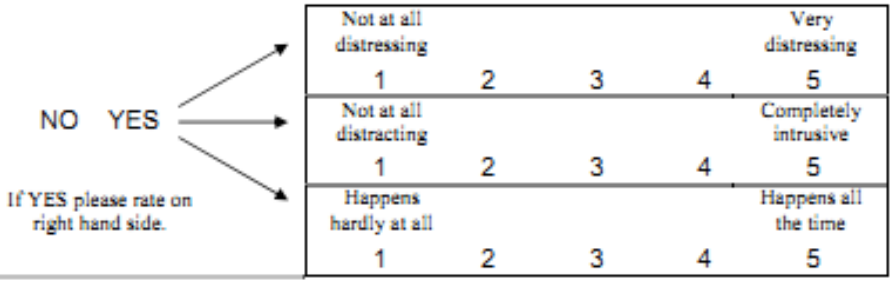
5) Do you ever experience unusual burning sensations or other strange feelings in or on your body ?



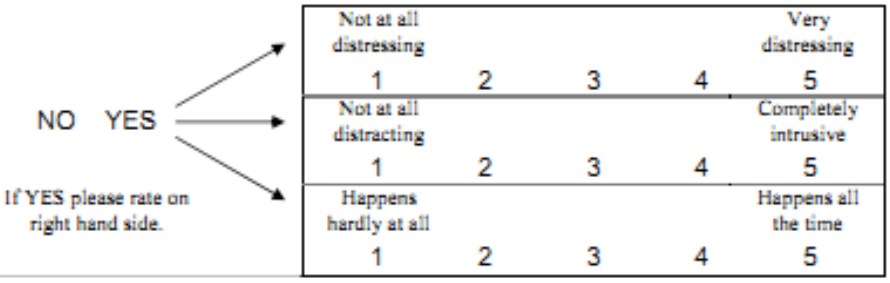
6) Do you ever hear noises or sounds when there is nothing about to explain them ?



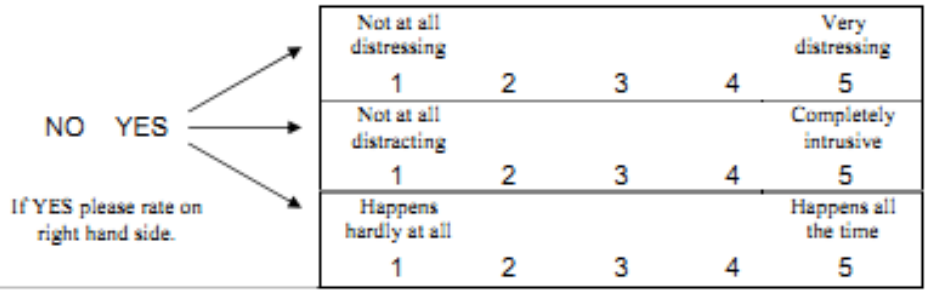
7) Do you ever hear your own thoughts spoken aloud in your head, so that someone near might be able to hear them ?



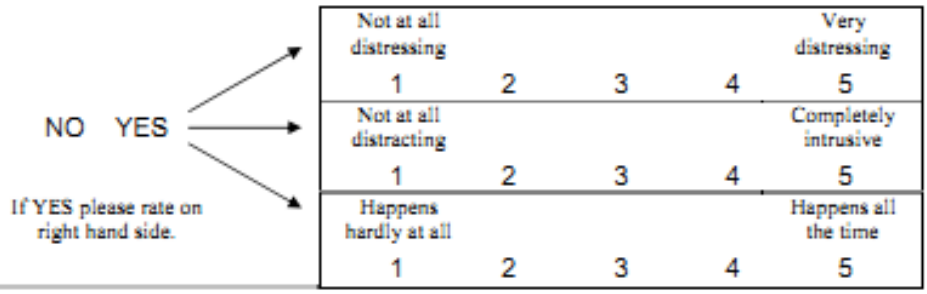
8) Do you ever detect smells which don't seem to come from your surroundings ?



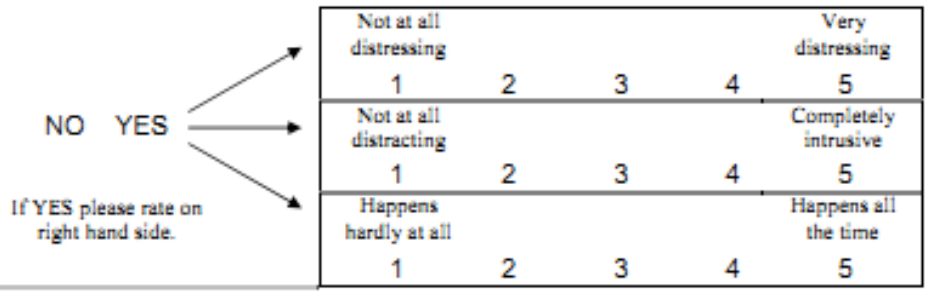
9) Do you ever have the sensation that your body, or a part of it, is changing or has changed shape ?



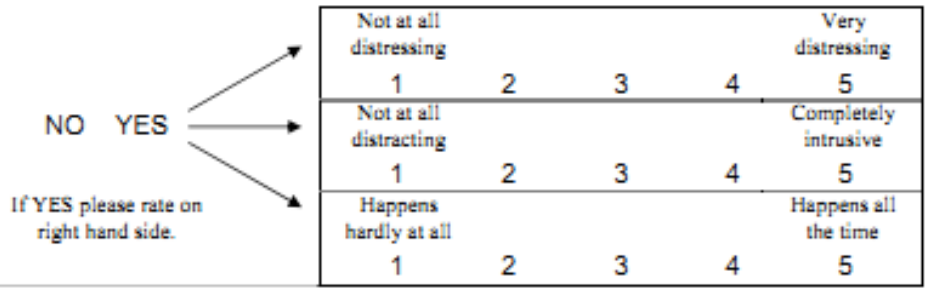
10) Do you ever have the sensation that your limbs might not be your own or might not be properly connected to your body?



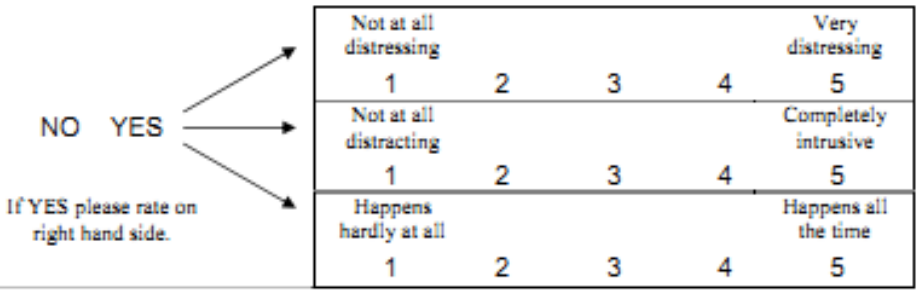
11) Do you ever hear voices commenting on what you are thinking or doing ?



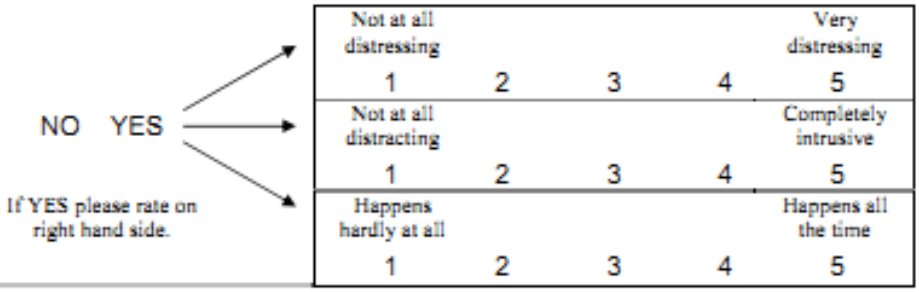
12) Do you ever feel that someone is touching you, but when you look nobody is there ?



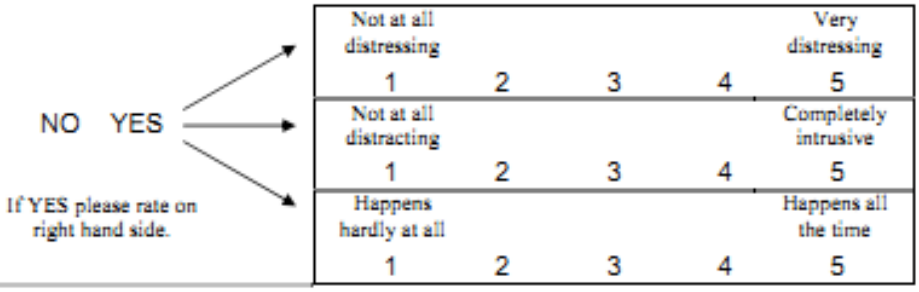
13) Do you ever hear voices saying words or sentences when there is no-one around that might account for it ?



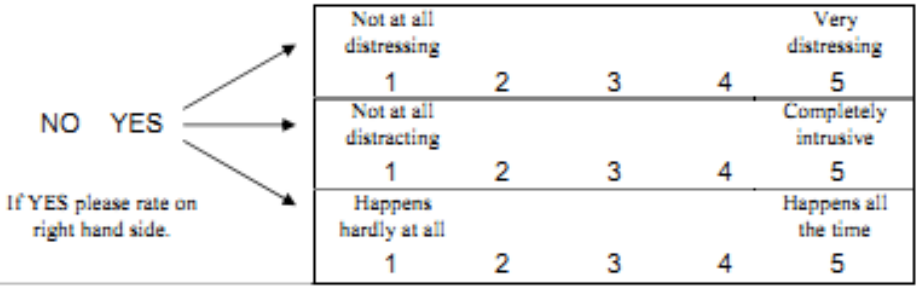
14) Do you ever experience unexplained tastes in your mouth ?



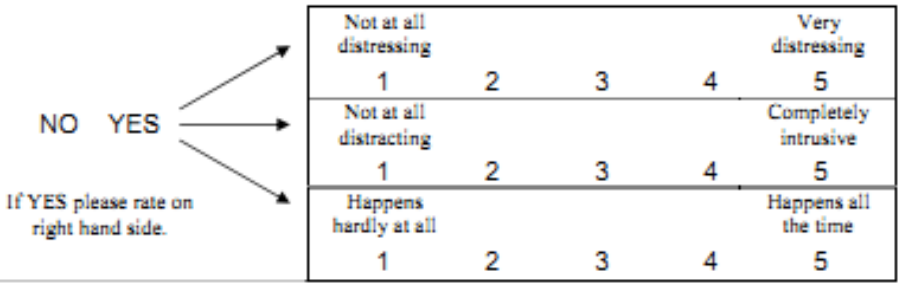
15) Do you ever find that sensations happen all at once and flood you with information ?



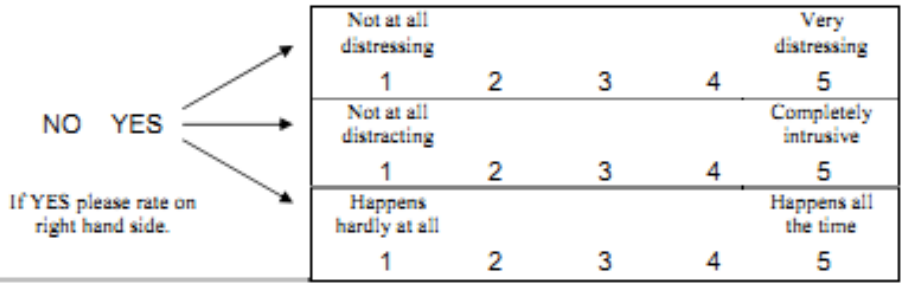
16) Do you ever find that sounds are distorted in strange or unusual ways ?



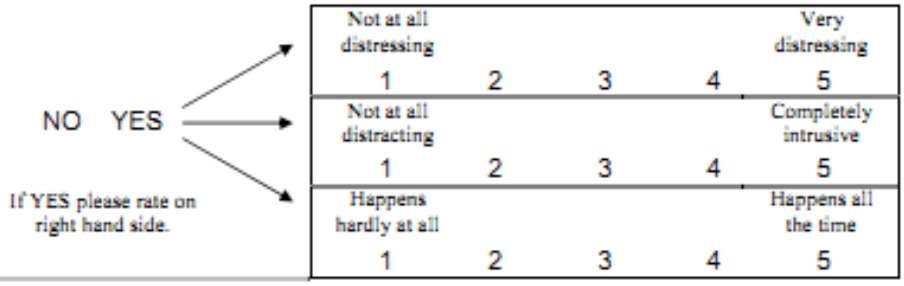
17) Do you ever have difficulty distinguishing one sensation from another ?



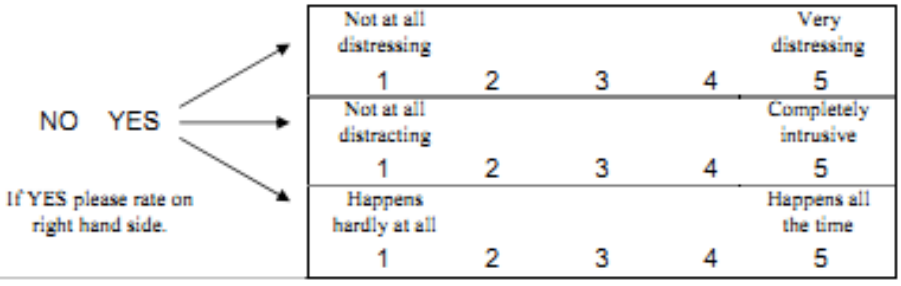
18) Do you ever smell everyday odours and think that they are unusually strong ?



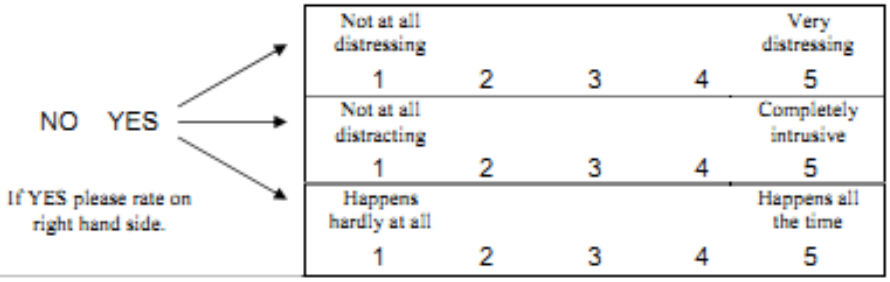
19) Do you ever find the appearance of things or people seems to change in a puzzling way, e.g. distorted shapes or sizes or colour ?



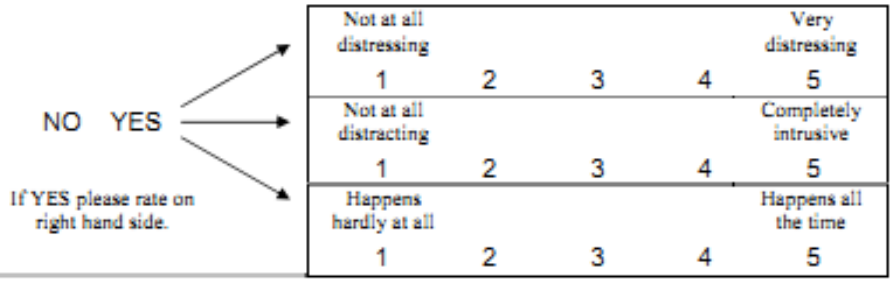
20) Do you ever find that your skin is more sensitive to touch, heat or cold than usual ?



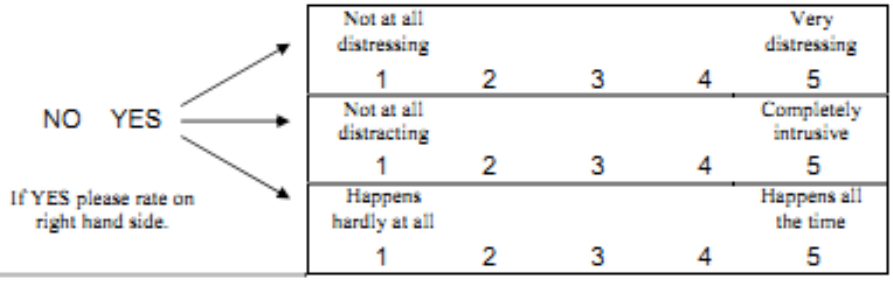
21) Do you ever think that food or drink tastes much stronger than it normally would ?



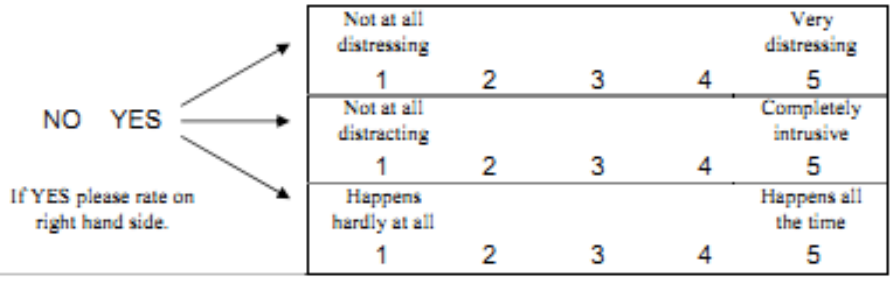
22) Do you ever look in the mirror and think that your face seems different from usual ?



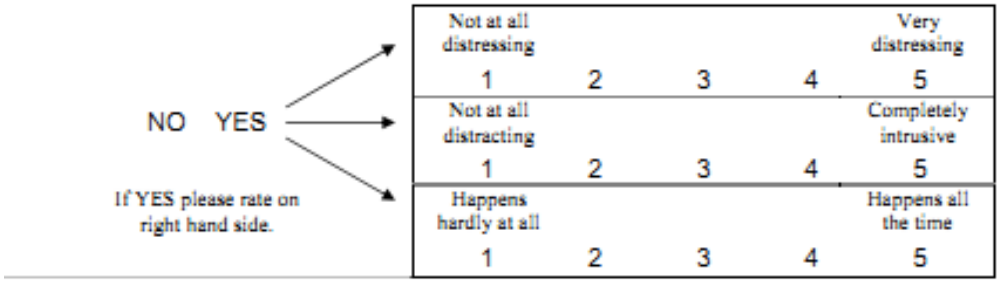
23) Do you ever have days where lights or colours seem brighter or more intense than usual ?



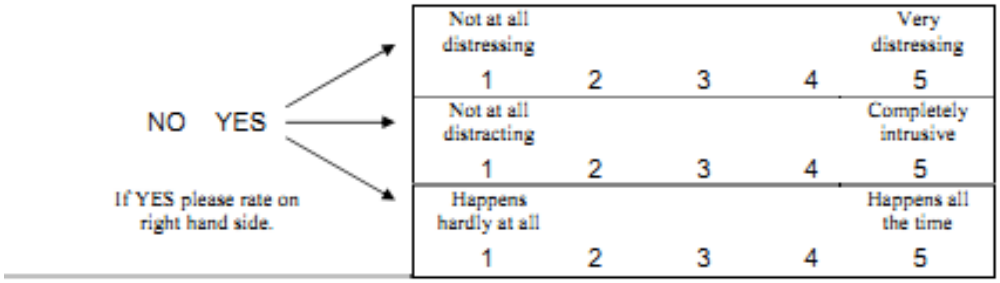
24) Do you ever have the feeling that of being uplifted, as if driving or rolling over a road while sitting quietly ?



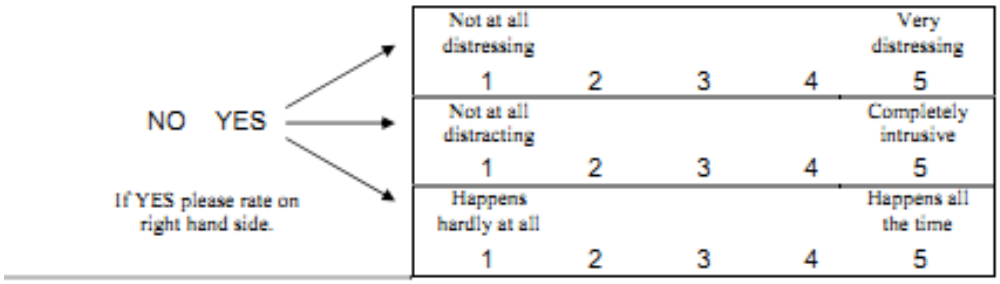
25) Do you ever find that common smells sometimes seem unusually different ?



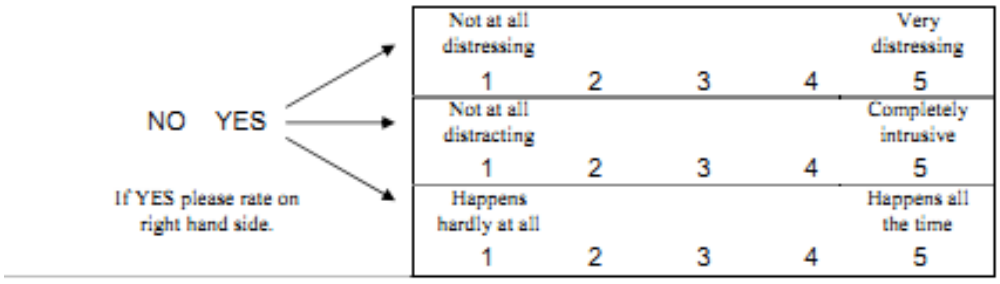
26) Do you ever think that everyday things look abnormal to you ?



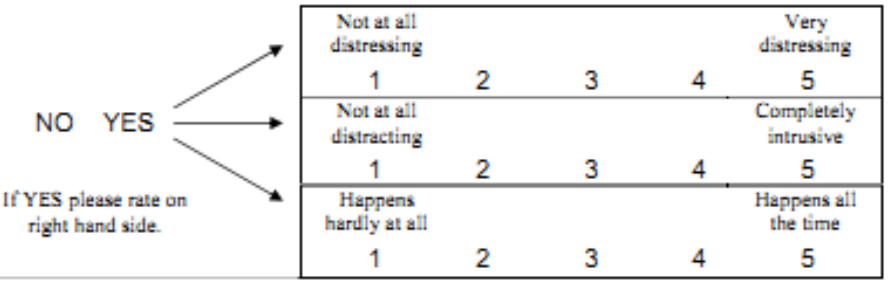
27) Do you ever find that your experience of time changes dramatically ?



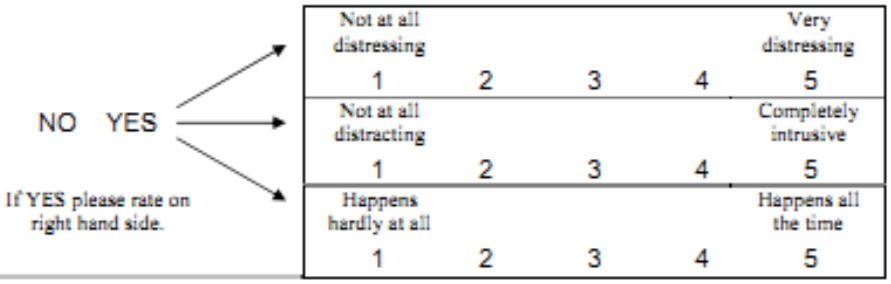
28) Have you ever heard two or more unexplained voices talking with each other ?



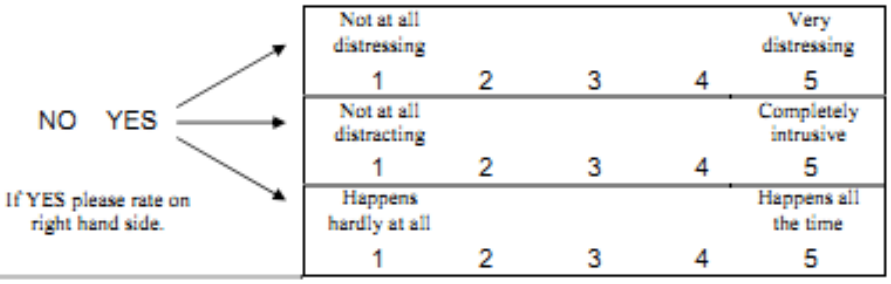
29) Do you ever notice smells or odours that people next to you seem unaware of ?



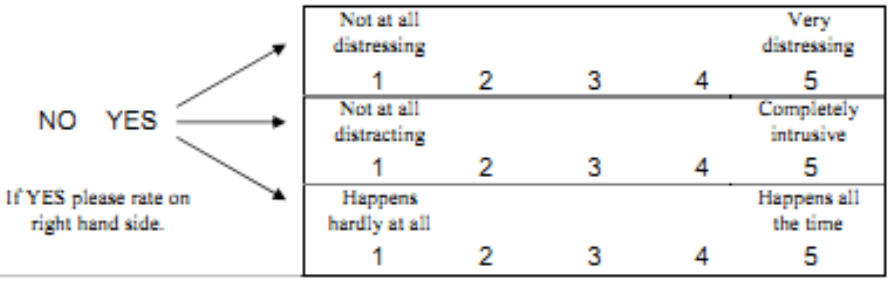
30) Do you ever notice that food or drink seems to have an unusual taste ?



31) Do you ever see things that other people cannot ?



32) Do you ever hear sounds or music that people near you don't hear ?



Appendix C- 6.5 Conscientiousness Scale

Participant # ☐☐☐

BFI – C

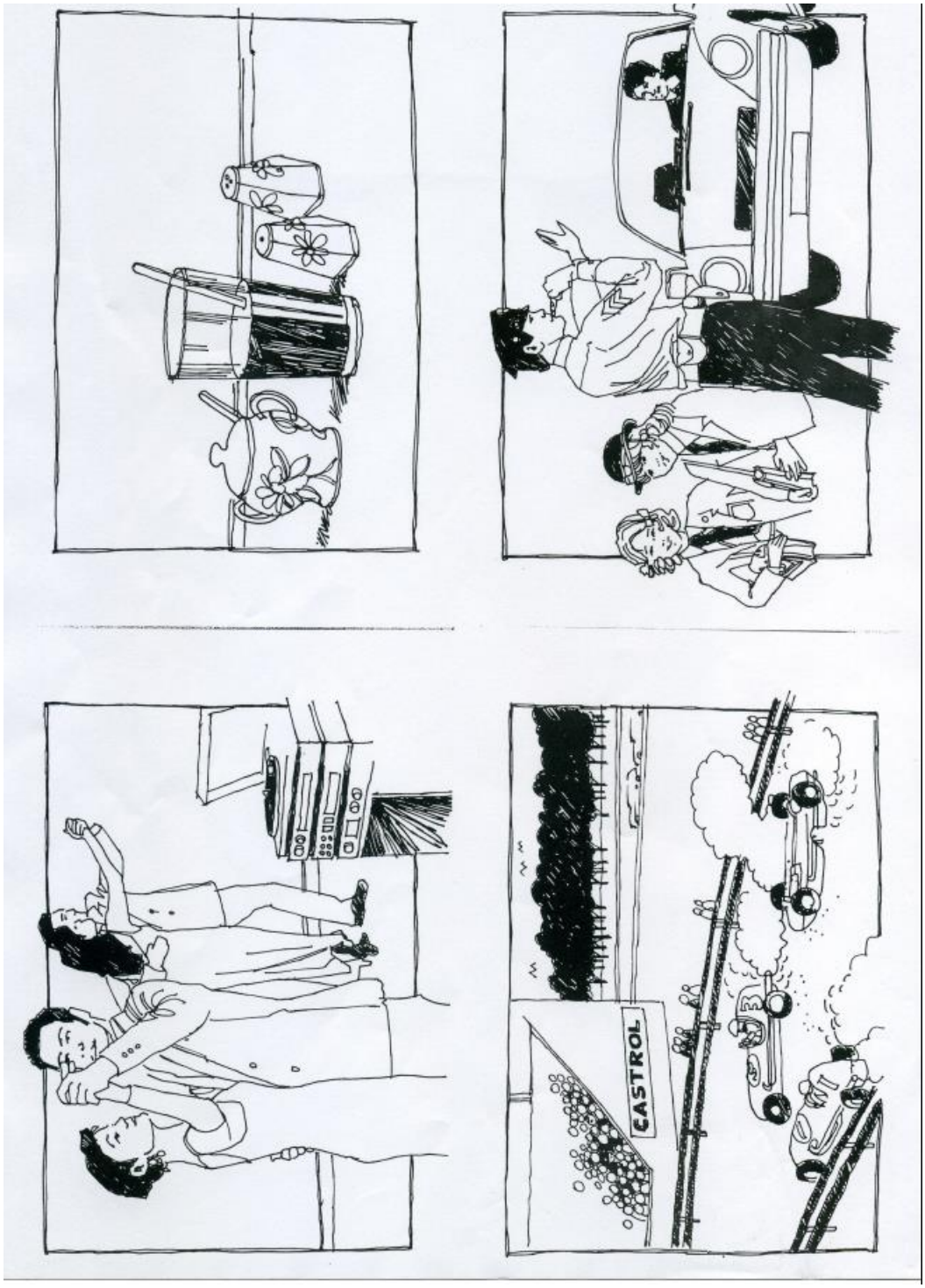
Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree Strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
1	2	3	4	5

I see myself as someone who….

1. ____ Does a thorough job
2. ____ Can be somewhat careless
3. ____ Is a reliable worker
4. ____ Tends to be disorganized
5. ____ Tends to be lazy
6. ____ Perseveres until the task is finished
7. ____ Does things efficiently
8. ____ Makes plans and follows through with them
9. ____ Is easily distracted

Appendix C-6.6 **Quick Test**



Quick Test Form

Participant # ☐☐☐

Instructions:

"This is a kind of picture game. I am going to show you some pictures and read some words. You point to the best pictures for the words. Some of the words will be very easy and some of the words will be hard. You won't know all the words. If I read a word that you don't know, just tell me that you don't know, and I will go on to another word".

Read a word on the list (below), and if the participant passes, then give more difficult words until the participant fails 6 consecutively. If the participant fails the first word, then read backwards until they pass a word, and then move forward until there are 6 consecutive fails.

1)	Belt (easy)	4	☐	26)	Graceful (10)	1	☐
2)	Dancing (easy)	1	☐	27)	Fluid (11)	2	☐
3)	Traffic (easy)	4	☐	28)	Solution (11)	2	☐
4)	Whistle (easy)	4	☐	29)	Discipline (12)	4	☐
5)	Fence (easy)	3	☐	30)	spacious (12)	1	☐
6)	Drink (easy)	2	☐	31)	crystallized (13)	2	☐
7)	Wreck (easy)	3	☐	32)	turntable (13)	1	☐
8)	Music (easy)	1	☐	33)	saccharin (14)	2	☐
9)	Medicine (easy)	2	☐	34)	immature (14)	4	☐
10)	Gun (easy)	4	☐	35)	cordiality (15)	1	☐
11)	Pepper (easy)	2	☐	36)	velocity (15)	3	☐
12)	Racing (easy)	3	☐	37)	decisive (16)	4	☐
13)	Salt (easy)	2	☐	38)	laceration (16)	3	☐
14)	Woman (easy)	1	☐	39)	foliage (17)	3	☐
15)	Sugar (easy)	2	☐	40)	imperative (17)	4	☐
16)	Track (easy)	3	☐	41)	intimacy (18)	1	☐
17)	School (6)	4	☐	42)	concoction (18)	2	☐
18)	Partner (6)	1	☐	43)	conviviality (18+)	1	☐
19)	Couples (7)	1	☐	44)	chevrons (18+)	4	☐
20)	Rail (7)	3	☐	45)	condiment (hard)	2	☐
21)	Respectful (8)	4	☐	46)	cacophony (hard)	3	☐
22)	Betting (8)	3	☐	47)	miscible (hard)	2	☐
23)	Daring (9)	3	☐	48)	imbibe (hard)	2	☐
24)	Stadium (9)	3	☐	49)	amicable (hard)	1	☐
25)	Pedestrian (10)	4	☐	50)	pungent (hard)	2	☐

Appendix C-7 Multiple Analysis of Covariance (MANCOVA) for Study Dependent Variables

A MANCOVA was conducted, with four dependent variables (voice unpleasantness, intrusiveness, believability, and personal sense of control), and 12 covariates (depression and anxiety symptoms, psychological flexibility, non-judgemental acceptance, conscientiousness, perceptual anomalies, trait use of reappraisal and suppression, and schizotypy. Due to multiple analyses the level of significance was set at $p < .01$.

Voice Unpleasantness

Table 7.3 presents the MANCOVA for the voice unpleasantness dependent variable and the covariates. There was no significant effect for the interaction between the covariates and condition (F 2, 87) = .004, n.s.

Table 7.3 MANCOVA: Dependent variable - Voice Unpleasantness

Potential Covariate	F	df1	df2	Significance
Quick Test IQ	1.150	1	87	.70
HADS Total	14.429	1	87	.18
AAQ-II Total	7.531	1	87	.33
Acceptance without Judgement (KIMS)	0.695	1	87	.77
Conscientiousness	2.887	1	87	.55
Unusual Experiences (O-LIFE)	0.042	1	87	.94
Cognitive Disorganisation (O-LIFE)	1.915	1	87	.62
Introvertive Anhedonia (O-LIFE)	0.394	1	87	.82
Impulsive Non-conformity (O-LIFE)	10.065	1	87	.26
Reappraisal (ERQ)	2.204	1	87	.60
Suppression (ERQ)	0.134	1	87	.90
CAPS Total	1.639	1	87	.65

Significant level set at $p < .01$

Voice Intrusiveness

Table 7.4 presents the MANCOVA for the voice intrusiveness dependent variable and the covariates. There was no significant effect for the interaction between the covariates and condition (F 2, 87) = .287, n.s.

Table 7.4 MANCOVA: Dependent variable - Voice Intrusiveness

Potential Covariate	F	df1	df2	Significance
Quick Test IQ	0.811	1	87	.71
HADS Total	29.748	1	87	.03
AAQ-II Total	18.827	1	87	.08
Acceptance without Judgement (KIMS)	1.052	1	87	.68
Conscientiousness	1.412	1	87	.63
Unusual Experiences (O-LIFE)	0.467	1	87	.78
Cognitive Disorganisation (O-LIFE)	0.106	1	87	.90
Introvertive Anhedonia (O-LIFE)	0.066	1	87	.92
Impulsive Non-conformity (O-LIFE)	9.888	1	87	.20
Reappraisal (ERQ)	12.594	1	87	.15
Suppression (ERQ)	0.260	1	87	.84
CAPS Total	0.896	1	87	.70

Significant level set at $p < .01$

Voice Believability

Table 7.5 presents the MANCOVA for the voice believability dependent variable and the covariates. There was no significant effect for the interaction between the covariates and condition (F 2, 87) = .429, n.s.

Table 7.5 MANCOVA: Dependent variable - Voice Believability

Potential Covariate	F	df1	df2	Significance
Quick Test IQ	2.309	1	87	.48
HADS Total	0.291	1	87	.80
AAQ-II Total	5.078	1	87	.29
Acceptance without Judgement (KIMS)	0.008	1	87	.97
Conscientiousness	0.001	1	87	.98
Unusual Experiences (O-LIFE)	0.482	1	87	.75
Cognitive Disorganisation (O-LIFE)	1.246	1	87	.60
Introvertive Anhedonia (O-LIFE)	7.605	1	87	.20
Impulsive Non-conformity (O-LIFE)	1.971	1	87	.51
Reappraisal (ERQ)	1.488	1	87	.57
Suppression (ERQ)	8.146	1	87	.18
CAPS Total	0.001	1	87	.99

Significant level set at $p < .01$

Personal sense of control

Table 7.5 presents the MANCOVA for the personal control dependent variable and the covariates. There was no significant effect for the interaction between the covariates and condition (F 2, 87) = .426, n.s.

Table 7.6 MANCOVA: Dependent variable - Personal Control

Potential Covariate	F	df1	df2	Significance
Quick Test IQ	0.001	1	87	.99
HADS Total	2.753	1	87	.61
AAQ-II Total	6.112	1	87	.45
Acceptance without Judgement (KIMS)	0.582	1	87	.81
Conscientiousness	4.101	1	87	.53
Unusual Experiences (O-LIFE)	7.230	1	87	.41
Cognitive Disorganisation (O-LIFE)	2.718	1	87	.61
Introvertive Anhedonia (O-LIFE)	4.509	1	87	.51
Impulsive Non-conformity (O-LIFE)	3.704	1	87	.55
Reappraisal (ERQ)	8.978	1	87	.36
Suppression (ERQ)	2.896	1	87	.60
CAPS Total	12.630	1	87	.27

Significant level set at $p < .01$